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ADDRESSES AND ORIGINAL ARTICLES

CLINICAL DATA IN ASTHMA*

BY L. J. WITTS, M.D. Manch., F.R.C.P. Lond.

ASSISTANT PHYSICIAN TO GUY'S HOSPITAL, LONDON; WILL EDMONDS CLINICAL RESEARCH FELLOW

THE following observations are based on a series of 500 patients with asthma who have been investigated at the asthma research clinic at Guy's Hospital during the last four years; 350 of them were over the age of 15. During the same period collateral investigations have been made on about 100 people who presented none of the symptoms of asthma or allied diseases. It is sometimes said that asthma is a symptom, and it is true that in those who have asthma the paroxysms may be induced by manifold stimuli, but it is wrong to confuse asthma with simple symptoms such as cough, vomiting, or diarrhœa. Associated phenomena add substance and colour to the conception of asthma as a clinical entity, and suggest clues to the ætiology of the disease. In recent years emphasis has shifted from the disease asthma to the asthmatic patient, and our conception of asthma cannot but be broader when we are familiar with the life-history of the asthmatic, and know the diseases to which he is particularly liable and those to which he appears immune.

Clinical Characteristics of Asthma

1. *The paroxysms.*—A history of paroxysms is rarely absent in true asthma, though in a few cases the paroxysm is replaced by a continuous but less violent dyspnœa. When the patient is seen in a paroxysm there is little difficulty in the diagnosis, but when this is not possible the story of attacks of dyspnœa, wheezing, and cough, with a special incidence in the small hours of the night and on rising in the morning, can usually be elicited with clarity from the patient and distinguished from other forms of respiratory distress. In fact it is seldom hard to differentiate asthma from organic lesions of the heart, lungs, or kidneys. In children or young women asthma is occasionally mimicked by hysterical hyperpnœa, which seems to originate in an unconscious fear of death, and in true asthma the attack may be prolonged by nervous overbreathing long after the bronchi have regained their normal calibre. The careful observer will not be deceived by these conditions in which there is none of the acute emphysema and expiratory difficulty of true asthma.

2. *The sputum.*—The paroxysm is the cardinal feature of asthma but the sputum brought up when the bronchial spasm relaxes is scarcely less characteristic. It contains many small bronchial plugs, mixed with mucus and saliva, and best seen against a dark background. Usually only a few of the plugs show a spiral structure under the microscope, but all these gelatinous masses have a similar origin from the secretion of thick mucus in the narrow bronchioles, and their recognition is as helpful in the diagnosis of asthma as are renal casts in the diagnosis of nephritis. The majority of the bronchiolar casts contain considerable numbers of eosinophil leucocytes, but eosinophilia is not constant owing to the disturbing effect of bronchial infection and the consequent appearance of numerous pus cells (Knott).

3. *Response to adrenaline.*—True asthma is always relieved by adrenaline when the drug is properly administered—i.e., in small doses, not exceeding 5 minims, repeated at frequent intervals if necessary. Severe cases of status asthmaticus can usually be controlled by the continuous administration of adrenaline as described by Hurst, though status asthmaticus is a dangerous condition which, like diabetic coma, should not be allowed to develop. Dyspnœa which does not respond to adrenaline is unlikely to be asthma.

4. *The blood.*—There is usually an increased number of eosinophil cells in the blood in active asthma, but when the disease is latent, as in hay asthmatics examined in the winter, eosinophilia disappears. Eosinophilia is of course in no way peculiar to asthma, occurring in a variety of conditions in which foreign protein is assumed to enter the blood stream. Nor is it necessarily a morbid phenomenon, for it can be demonstrated in the majority of infants when new foods are added to the diet, and it occurs in adults, both healthy and anæmic, after the ingestion of large amounts of whole liver.

5. *Allergic symptoms.*—Asthmatics frequently suffer or have suffered from diseases such as eczema, urticaria, rhinorrhœa, and hay-fever, which are attributed to hypersensitiveness to protein substances. A history of one or more of these diseases is given by over 40 per cent. of our patients.

6. *Family history.*—A family history of asthma or of one of the above-mentioned allergic diseases is given by 60 per cent. of our patients. While there is no doubt that asthma and the other allergic diseases I have mentioned are closely related, our collateral investigations on apparently healthy people do not support the view that this group of diseases can be regarded simply as the manifestation of an inherited allergy or protein hypersensitiveness. Bruce Pearson has found that 30 per cent. of healthy adults have either a personal or family history of allergy. Much higher figures are given by the American worker, Vaughan, whose conception of allergy is more embracing than ours. Study of the skin reactions has also shown the great frequency of latent allergy as compared with overt allergic disease.

7. *Skin reactions.*—In a high proportion of asthmatics the skin gives an exaggerated response, as compared with the normal, when a minute dose of protein is scratched or injected into it. The percentage of asthmatics who give positive reactions is variously estimated at from 30 to 80, according to the number of tests performed, the technique employed, and the age of the patient, reactions being more frequent in early life. At the Guy's clinic, where the scratch method has hitherto been more commonly employed, positive reactions are obtained in approximately 40 per cent. The frequency of reactions seems to be more closely correlated with the age at onset of the asthma than with the age of the patient. Thus, of 129 asthmatic children under the age of 15, 45 per cent. gave positive reactions; of 31 asthmatics over the age of 30, whose asthma began before the age of 15, 52 per cent. gave positive reactions; and of 154 asthmatics over the age of 30, whose asthma did not begin till after the age of 15, 32 per cent. gave positive reactions. I have never been persuaded that there is any biological difference between asthmatics who do and those who do not give positive skin reactions, and the following observation, which is by no means isolated, shows how unwise it is to

* Based on a paper read before the York Medical Society on Dec. 2nd, 1933.

endeavour to divide asthma into hereditary allergic and acquired bronchitic types.

Variation of asthma in father and child.—A man, aged 50, came under treatment for asthma in February, 1933. The disease had begun in early life, but he knew of no other case in the family. His chest was wheezy and emphysematous, the X rays showed fibrotic changes in the apices of both lungs, the sputum was purulent but contained no tubercle bacilli. Intradermal skin reactions to a variety of proteins were negative. The blood pressure was on the high side, 170/110. His asthma might have been regarded as acquired and attributed to morbid changes in the lungs, had he not brought his daughter aged 5 to see us in July of the same year, because she had had dyspnœa on exertion and attacks of wheezing at night for the last fortnight. The child had had a "touch of bronchitis" every winter since infancy. She was a well-nourished girl and physical examination was negative, but skin tests showed that she was pollen-sensitive. There was no asthma on the maternal side, and there can be little doubt that this girl, who was a hay asthmatic, had inherited the disease from her father, who was a bronchial asthmatic.

I have already referred to the frequency of latent allergy in the general population and this is confirmed by the incidence of positive skin reactions. Bruce Pearson has found that 20 per cent. of healthy adults give intradermal reactions to significant dilutions of common substances such as horse dander, chicken feathers, egg albumin, and wheat, as compared with some 75 per cent. of asthmatics. Normal individuals who react have no symptoms to suggest that they are clinically hypersensitive, but positive skin reactions are more common where there is evidence that symptoms have occurred in the past or have been present in the forebears.

8. *Status asthmaticus.*—It must not be assumed that all, or indeed the majority, of the associated phenomena which I have just described are present in every case of true asthma; the severest examples of the disease are often the least typical, as the following example will show. I would particularly emphasise the long and complete remission of symptoms, and the subsequent fatal exacerbation, as both events are hard to explain on the simple allergic hypothesis of asthma.

Atypical asthma with death in status asthmaticus.—The patient, a clerical worker, had no family history of asthma or allied diseases, and had not suffered from any other form of allergy, or indeed from any illness at all. His asthma began spontaneously at the age of 27, and after treatment by inhalations and autohæmotherapy he was completely free for three and a half years. The asthma then recurred again in the same mysterious way as it had begun. The attacks were accompanied by flatulent dyspepsia and by obstruction of the right nostril—his nasal septum was deflected. The only other abnormality was a rather low blood pressure, 100/70. Routine skin tests by the scratch method were all negative, though there was a doubtful response to the intradermal injection of wheat extract. The sputum offered for examination was never characteristic of asthma. The patient used large amounts of adrenaline, which he injected himself, and it was felt that he was exaggerating his symptoms. It was arranged to have the deflected septum corrected by operation, but before this could be done, he appeared at the clinic in status asthmaticus and died soon after admission to hospital, his age then being 32. Post-mortem examination was not allowed.

Three patients in this series are known to have died in status asthmaticus. It is noteworthy that in all of them the disease began in adult life, there was no family or previous history of asthma or allied allergic states, and the routine skin tests were negative. It is very difficult to adapt these facts to the theory that asthma is a hereditary allergic dystrophy, simply explained by protein hypersensitiveness. Watching asthmatics over long periods one is often constrained to think that there are variations in the resistance to asthma, periods when the slightest stimulus induces an attack, periods when great liberties can be taken with impunity. These fluctuations appear to be in the patient and not in the environment, the ebb and flow of biological tides controlled by unknown forces. It is these forces which await discovery, and as yet there is no clue to their nature.

Diseases Associated with Asthma

It is clear that asthma and allergy are by no means synonymous. It is not always possible to demonstrate protein hypersensitiveness in asthmatics, though this may be because our tests are not sufficiently comprehensive. It seems to be quite certain that an allergic tendency can be demonstrated in the great majority of infants and in 20 to 30 per cent. of adults; but only a small fraction of the population, variously estimated at from 0·2 to 3·5 per cent., and probably averaging 1 per cent., is affected by asthma. Many people have tried to get over these difficulties by accepting a hereditary or constitutional background to asthma, which may be either the allergic tendency or an unstable autonomic nervous system, and by assuming that asthma does not develop unless a further factor is introduced, such as nasal disease, damage to the respiratory tract, alimentary disorder, endocrine imbalance, or psychological disharmony. But many of the things which have been said to excite asthma are really effects of the disease, and once a patient becomes asthmatic the asthma tends to persist or to recur, even though these factors have been removed. In what follows I have reviewed the medical history of our 500 patients to see if the other illnesses from which they suffer or have suffered shed any light on the causation of their asthma.

1. *Infections.*—There is not sufficient evidence in our records to decide whether asthma is associated with any general change in the resistance to infection, but careful attention has been paid to the two diseases, tuberculosis and rheumatism. Continental authors have sometimes traced a connexion between asthma and tuberculosis, but our records suggest that there is an actual antagonism between the two diseases. All our patients have been radiographed, and whenever the films suggested an organic lesion in the lungs, the sputum has been specially examined for tubercle bacilli. In no case have we found tubercle bacilli, and in only one case is there a history of the previous finding of tubercle bacilli in the sputum. The following summary of the tuberculous lesions from which our patients have suffered suggests an unusually low incidence of tuberculosis in asthmatics:

	Per cent.
Tuberculosis of glands	0·4
,, ,, peritoneum	0·2
,, ,, lungs	0·2
,, ,, skin	0·2
,, ,, kidney	0·2
Total tuberculous lesions ..	1·2

For details of the post-mortem examination on the case of tuberculosis of the kidney, which was latent and not suspected in life, I am indebted to the pathology department of the London Hospital. The patient, who was a varnish maker, came to us at the age of 45 on account of asthma of twelve years' duration. He was sensitive to codfish, horse dander, and cat hair, and also gave a delayed skin reaction to the rosin he used in his work. He was an asthenic individual with a blood pressure of 170/100. X ray examination suggested tuberculosis of

the left apex and hilum, but the sputum contained many eosinophil cells, few bacteria, and no tubercle bacilli. He died a year later from rupture of a congenital intracranial aneurysm, associated with cardiovascular hypertrophy. There was an area of fibrosis containing a caseo-calcareous nodule beneath the pleura at the apex of the left lung, and a pinhead calcareous nodule at the right apex. The right kidney was destroyed by chronic tuberculosis, being converted into a thin-walled fibrous sac containing caseous material with a few areas of recognisable renal tissue; the right ureter was blocked with caseous material.

A similar antagonism appears to exist between asthma and rheumatism. This is a matter of some interest on account of the evidence that rheumatism is associated with hypersensitiveness to streptococci. Bacterial hypersensitiveness of this kind must be entirely unrelated to the protein hypersensitiveness of asthma. I shall show later how seldom asthma is associated with rheumatic heart disease. The total incidence of rheumatism in this series of patients was:—

Acute rheumatism . ..	2·6 per cent.
Chronic ,, ...	0·8 ,, ,,

2. *Diseases of alimentary tract.*—Asthma is frequently accompanied by flatulent dyspepsia and colon spasm, but severe symptoms of gastro-intestinal allergy, such as swelling of the lips and tongue, intestinal colic, vomiting, and diarrhœa, are exceptional in this series of patients. The dyspepsia of asthma usually escapes the surgeon's knife, and in this regard asthmatics are in fortunate contrast with patients with achlorhydria, visceroptosis, and chronic abdominal invalidism. I have observed the following lesions amongst our asthmatics:—

	Per cent.
Peptic ulcer..	1·0
Cholecystitis	0·6
Acute appendicitis	2·2
Chronic appendicitis	0·6
Anæmia (all female)	1·4
Catarrhal jaundice	1·2

The peptic ulcers were diagnosed by operation in two cases (one before and one after the onset of the asthma), by hæmatemesis in two cases, and by death from perforation in one case. The lesions of the gall-bladder and the appendix had all been submitted to operation. The cases of anæmia were all examples of idiopathic hypochromic anæmia, and in the one woman on whom a test-meal was performed there was achlorhydria. All these figures are low and we have found no evidence of an abnormal incidence of gastro-intestinal disease in asthmatics. Fractional test-meals were performed on 67 asthmatics at the Guy's clinic and at New Lodge, most of them adults, and the results fell within the normal limits (Knott, Oriel, and Witts). These findings agree with those of Vanzant and co-workers, who have likewise reported that there is no abnormality in the gastric secretion in adults with allergic disease. They are in striking contrast with those obtained by Bray in 200 asthmatic children, of whom more than half had achlorhydria or hypochlorhydria. For a number of years I have been specially interested in achlorhydria and anæmia, and I have rarely seen the condition complicated by asthma. Wilkinson observed asthma and bronchitis in 3·5 per cent. of his large series of patients with pernicious anæmia, which is probably a normal incidence at that time of life. In view of the normality of the gastric secretion in adult asthmatics, and the rarity of the association of asthma with diseases which are characterised by achlorhydria, such as the achlorhydric anæmias, rheumatoid arthritis, and exophthalmic goitre, it is unlikely that achlorhydria is a significant factor in the ætiology of asthma.

I believe that the achlorhydria of asthmatic infants is the result of an allergic gastritis from irritation of the stomach by foods to which the child is sensitive. It is in other words an "eczema" of the stomach and only a symptom of the disease, like the eczema of the skin which frequently coexists. As the child grows older and passes out of the phase of sensitivity to the common foods, the eczema and the gastritis recover but the asthma remains. Naturally the child will benefit from treatment of the gastritis with hydrochloric acid and pepsin, and indeed it is always worth trying the effect of acid in patients with alimentary allergy.

I have also seen nothing to support the view that asthma is the result of an alimentary toxæmia. Asthmatics show none of the degenerative changes in the tissues or the lack of resistance to intercurrent infection which we are accustomed to meet in proven toxæmias such as chronic nephritis, hepatic insufficiency, or lead poisoning. No asthmatic toxin has ever been isolated. It is true that the paroxysms may sometimes be inhibited by fasting and drastic purgation, but the same measures may produce relief in epilepsy and diabetes mellitus and are no proof of toxæmia. Dr. F. A. Knott made microscopic and bacteriological examinations of the stools in 120 patients with asthma at the Guy's clinic and arrived at the conclusion that no specific changes were present in the stools. I am unconvinced that disorders of the alimentary tract have any fundamental connexion with asthma.

3. *Upper respiratory tract.*—There is an intimate link between morbid conditions of the upper respiratory tract and asthma, and it is not uncommon for hay-fever, chronic catarrh, or nasal obstruction to precede by some years the onset of asthma. The experiments of Brodie and Dixon, which showed that reflex spasm of the bronchi could be produced by stimulation of areas in the nose, led to the belief in a nasal or reflex type of asthma, and many operations were performed on asthmatics, often for quite minor variations from the normal in the nose. Time has shown that it is unusual for asthmatics to gain any lasting relief from such operations, and present opinion is that operations on the nose in asthma are only permissible where the indications for the operation would also exist if asthma were absent. To-day interest has turned rather to the effects of the allergic reaction on the nasal mucous membrane and the sinuses, for it seems that the œdema and the loss of ciliary action in the nasal mucosa, which are so often associated with recurrent attacks of asthma, may predispose to infection of the sinuses and the formation of polypi, and that the latter are often the result rather than the cause of asthma.

Of our total cases 72, or nearly 15 per cent., have had operations on the nasal tract, the cases being equally divided into operations on the sinuses, operations on the septum and turbinates, and removal of polypi, with a few cauterisations. The failure of the operations to relieve the asthma permanently is shown by the fact that most of the patients had had their operations before they came to us for further treatment of their asthma. In a small series of cases where operation was advised by us, I find 65 per cent. were unimproved as regards their asthma, 21 per cent. had temporary relief with relapse in a few months, and 14 per cent. had more lasting relief. The period of observation has been short and experience leads us to expect that most of those who are

still free will relapse after a few months or years. I have not included cases in which tonsils or adenoids have been removed, as this operation has been performed on nearly all our younger patients and has no effect on asthma. These asthmatics who have had operations on the nose differ in no way from their fellow sufferers, 60 per cent. having a family history of asthma or allied diseases and 36 per cent. giving positive skin reactions. There is no support for belief in a special nasal type of asthma or for promise of any lasting amelioration of asthma by operations on the nose. The following case illustrates my point about the constitutional background in cases of "nasal asthma":—

A man, aged 46, had had his left antrum infected during a tooth extraction ten years previously. He was left with chronic nasal catarrh and occasional acute attacks of sinus trouble, and at the age of 43 developed asthma, which defied all attempts at relief, including extensive operations on the nose. His brother, sister, mother, and many maternal relatives were asthmatic, and he himself had had eczema in adolescence and pruritus ani on and off ever since.

4. *Lower respiratory tract.*—Disease of the bronchi or lungs can be detected in the majority of asthmatics and becomes more evident the longer the disease lasts. Indeed the quality of asthma changes as the years go by, assuming a more purely respiratory character. In childhood the attacks often last from two to seven days, and are accompanied by headache, vomiting, bowel disturbances, and general prostration, which may be more troublesome than the dyspnœa. In later life symptoms of general intoxication are rarely pronounced, and the attack is characterised by dyspnœa, wheezing, and cough of relatively brief duration; recovery however is rarely as complete as in childhood, and over 50 per cent. of adults suffer from dyspnœa between the attacks.

It is always difficult to decide to what extent respiratory lesions are the cause, to what extent the effect of asthma. A first attack of asthma is often mistaken for influenza, bronchitis, or whooping-cough. Especially in young asthmatics there are attacks of fever, dyspnœa, and cyanosis, which clinically resemble pneumonia, though there are no physical signs of consolidation and the lungs are translucent to X rays. In other cases true pneumonia occurs, with hæmoptysis, empyema, or residual changes in the lungs. Nearly 30 per cent. of our patients give a history of pneumonia, congestion, or pleurisy. In over 20 per cent. these illnesses occurred after the age of 15, when confusion between asthma and pneumonia is less likely. More than half the attacks were after the onset of the asthma. There is no clinical distinction between those who have and those who have not had pneumonia, the incidence of a hereditary element (60 per cent.) and positive skin reactions (40 per cent.) being identical in the two groups. Bronchitis also is commonly associated with asthma, examination of the sputum showing that the terminal bronchioles are infected in three out of every four asthmatics over the age of 20. It seems fair to conclude that—

(*a*) Organic disease of the bronchi and lungs is frequent in patients with asthma;

(*b*) it is more common for the lesions to follow than to precede the onset of asthma;

(*c*) hereditary and allergic factors occur just as often in those affected as in those free from organic lesions of the bronchi and lungs, and there is no distinct bronchitic type of asthma;

(*d*) these findings are most easily explained by an abnormal susceptibility of the asthmatic to lesions of the respiratory tract, though it is probable that the local tissue damage is sometimes the deciding factor between latent and manifest allergy.

5. *Circulatory system.*—Although the terms cardiac asthma and renal asthma are still employed, the attacks of nocturnal or paroxysmal dyspnœa which occur in advanced disease of the heart and the kidneys are entirely different in pathology and appearance from true asthma and no further reference will be made to them here. On the other hand the laws of chance suggest that cardiac disease and true asthma will occasionally appear together. Indeed it might be expected that disease of the heart, by producing congestion of the lungs and bronchi, would favour the development of asthma in latent allergy, and asthma and heart disease would coexist more often than could be explained by a casual association. Actually the reverse is the case. I have already spoken of the antagonism between asthma and rheumatism, and this is reflected on examination of the heart. Mitral disease was detected in only two of our patients (0·4 per cent.) and in both it was mild and well compensated. Only two patients with aortic disease, one rheumatic, one syphilitic, have attended the clinic; in both instances the dyspnœa appeared to be of cardiac origin and none of the stigmata of asthma was present.

It is possible that we so seldom see asthma associated with valvular disease of the heart because our patients are selected before they come to us, and those who have asthma and a cardiac lesion are treated for heart disease. But I do not think this is the explanation, for many of our patients come to us direct, and many of those who are referred to us have a high blood pressure. It seems rather that there is a real antagonism between asthma and rheumatism, so that asthmatics rarely suffer from rheumatism and even more rarely from valvular disease of the heart.

In the accompanying Table I have analysed the systolic blood pressures of 440 asthmatics over the age of 10 years who have attended the asthma clinic. The numbers are relatively small, only 76 of the

Sex and age.	Pressure in millimetres of mercury.											Total cases.
	90–99	100–109	110–119	120–129	130–139	140–149	150–159	160–169	170–179	180–189	190–199	200–	
Males.													
10–14	5	26	17	6	2	..	..	..	..	..	..	..	56
15–19	2	3	6	6	8	1	..	..	..	..	..	..	26
20–29	..	9	12	8	9	5	2	..	..	..	..	..	45
30–39	..	1	5	13	9	3	..	..	..	..	..	..	31
40–49	..	2	4	7	3	2	..	1	1	..	..	..	20
50–	..	2	2	7	6	2	2	3	1	..	..	..	25
Females.													
10–14	2	5	8	3	2	..	..	..	..	..	..	..	20
15–19	1	2	2	8	8	1	1	..	..	..	..	..	23
20–29	4	6	17	21	12	3	1	1	..	..	..	..	65
30–39	1	4	12	19	15	6	2	1	1	..	..	..	64
40–49	..	2	7	5	9	10	4	1	3	..	1	1	43
50–	..	..	4	3	4	3	1	2	1	1	..	3	22
Total cases	15	62	96	106	90	36	13	9	7	1	1	4	440

males and 129 of the females being over the age of 30. Nevertheless they are sufficient to show that there is no great difference between the blood pressures of asthmatics and those of the general population, as can be seen by comparing this Table with the average figures for men and women given by Alvarez and Stanley, and by Wetherby. Low blood pressure is no more frequent in asthma than in health. A systolic blood pressure of 150 mm. of mercury or over is found in 15 per cent. of asthmatics over the age of 30. Of these asthmatics with hyperpiesia, 45 per cent. have a family history of asthma or allied allergic disease, and 42 per cent. give positive

skin reactions. There is no difference between the patients with hyperpiesia and those with a normal blood pressure, as I have shown in more detail in an earlier paper (Witts, 1933), and it is probable that the asthma and the hyperpiesia are not connected in ætiology; the incidence of hyperpiesia is the same in asthma as in the non-allergic. It has likewise been shown that allergy is no more frequent in hypertension than in health, and there can be little doubt that the association of hyperpiesia and allergy is a matter of chance (Cohen). Instances of angina and abnormal cardiac rhythm have recently been described, which appeared to be due to protein hypersensitiveness, but in this series of asthmatics there is only one doubtful case of angina and no case of cardiac arrhythmia.

6. *Urogenital tract.*—I have already commented on the rarity of the association of asthma with rheumatism and valvular disease of the heart, diseases which are nowadays attributed to sensitisation to the streptococcus. A similar interest attaches to lesions of the kidney, owing to the similar attribution of acute nephritis to sensitisation to bacteria such as the streptococcus and the pneumococcus. Here again we have found no connexion between asthma and renal disease, as the following analysis shows:—

	Per cent.
Nephritis	0·6
Pyelitis	0·2
Nephrolithiasis	0·4
Hernia (operated)	1·2
Hysterectomy	1·0
Curettage	0·4

7. *Endocrine system.*—It is not surprising that asthma should have been attributed to defects in the ductless glands, and only recently Burn has revived the hypothesis that asthma depends on an impaired production of adrenaline. The rarity of the association of asthma with Addison's disease, and the normality of the blood pressure in asthma, are strong arguments against this hypothesis, though growing knowledge of the complexity of the adrenal secretions suggests that they do not rule it out. The following endocrine abnormalities have been observed in our patients:—

	Per cent.
Myxœdema (active)	0·6
Hyperthyroidism (arrested)	0·2
Fröhlich's syndrome	0·4
Diabetes mellitus	0·2

Recognisable disease of the ductless glands is thus uncommon in asthma. Such lesions as do occur are those of deficiency and not of excess, and in this connexion it is of interest to note the infrequency of hyperthyroidism in asthma, and the frequency with which asthma improves during pregnancy, when the activity of the ductless glands is enhanced.

8. *Nervous system.*—It is well known that asthma is profoundly affected by the emotional state of the patient and may, like gout or epilepsy, become the final common path for the expression of unpleasant stimuli in those who suffer from the disease. In chronic asthmatics this conditioned reflex is extraordinarily sensitive, the most trivial stimuli induce an attack, and the asthmatic woman may evince her discomfort at menstruation not by a headache but by an attack of asthma. It is a far cry from this, however, to regard asthma merely as a symptom of an anxiety state, and without going into further detail I will only say that such phenomena as the cutaneous reactions, the Prausnitz-Küstner reaction by which the allergic phenomenon may be passively transferred from an asthmatic to the skin of a normal man, the eosinophilia and other changes in the blood, and the serological changes demonstrated by Harley, have not yet been explained by those who regard asthma as a psychoneurosis.

Organic disease of the nervous system has been almost absent in this series of cases, the exception being a young woman who had apoplexy during an attack and was left with an organic hemiplegia of the left side. It has not been possible to assess the relationship between asthma and migraine, because the paroxysms of asthma are so often accompanied by headache and sickness. Epilepsy, which by some is regarded as an allergic disorder, occurred in only two (0·4 per cent.) of this series of patients.

Discussion

The results of this survey are mainly of a negative character. It seems clear that asthma is a clinical entity, and that attempts to split it into types such as allergic asthma, nasal asthma, bronchial asthma, are mistaken, for the nature of the paroxysms, the response to treatment, and the frequency of inheritance, protein hypersensitiveness, and respiratory disease are the same in all the categories. Careful measurements of large numbers of children at the Hospital for Sick Children, Great Ormond-street, have shown that asthmatic and rheumatic children do not differ from the general population of children from which they are drawn in bodily conformation or physical type. We have found no difference between the asthmatic and the normal as far as concerns the alimentary, urogenital, nervous and endocrine systems, and the blood pressure. Endocarditis is rather uncommon in asthma and all forms of rheumatism relatively infrequent. Clinical tuberculosis also appears to be unusually uncommon in asthma.

The striking differences between the asthmatic and the normal are, firstly, the frequency of protein hypersensitiveness, both as revealed by the cutaneous reactions and as manifested by its effects in the personal and family history; and secondly, the high incidence of morbid changes in the upper and lower respiratory tract. It would be tempting to see the whole pathology of the disease in the coincidence of allergy with a respiratory lesion, which accounted for the localisation of the symptoms in the bronchi and their manifestation as asthma, but there are objections to such a thesis. Severe asthma occurs in patients with little sign of protein hypersensitiveness or damage to the respiratory tissues. Lesions of the respiratory tract as often follow as they precede asthma, and it is at least possible that they are the result rather than the exciting cause of the disease. Protein hypersensitiveness and respiratory disease are both common amongst the general population, and one would expect a higher incidence of asthma if they were the only factors involved. I have previously referred to the unexplained fluctuations in asthma, which appear to be due to variations in the internal milieu of the organism rather than changes in the environment or the respiratory tract. Burn has recently revived the attractive hypothesis that asthma may be associated with a deficiency of circulating adrenaline, and a biochemical abnormality of this kind may be the third unknown in the unsolved problem of asthma.

Summary

(1) The records of 500 asthmatic patients, of whom 350 were over the age of fifteen, have been reviewed, and the findings on physical examination and the diseases associated with asthma have been analysed. (2) Asthma is a clinical entity and there is no

justification for its subdivision into types. (3) The most striking differences between the asthmatic and the normal are the high incidence of protein hypersensitiveness and the frequency of lesions of the upper and lower respiratory tract. (4) Bacterial allergy, of the type which is believed to give rise to rheumatism, carditis, and acute nephritis, rarely occurs in asthma. (5) Clinical tuberculosis is extremely uncommon in asthma. (6) The theory that asthma is the result of the general factor, protein hypersensitiveness, and the localising factor, damage to the respiratory tissues, is briefly discussed; it does not appear to be a complete explanation of the disease.

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RIGHT-SIDED DUODENUM INVERSUM

A RECORD OF ELEVEN CASES

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With an account of the Development of the Duodenum

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IT is 37 years since the first attempt was made to investigate the stomach by radiography. It was made by Strauss within a year of the discovery of X rays. Even if we neglect this date, it is 28 years since Rieder (about 1905) put the study of the stomach with X rays on a definite foundation. During this period millions of stomachs have been examined by thousands of radiologists, and it might have been expected that all there was to be learnt about the stomach and duodenum, as far as the X ray investigation goes, would already have been published. This, however, is not the case. A great deal remains to be found out, especially about congenital variations in this region.

A condition to which very little attention has been paid until the last year or so is the "right-sided duodenum inversum." It seems almost incredible that it should have been missed for so long; for it cannot be very rare if I have been able to collect 11 cases in private practice within a year, the last 5 within six weeks. Yet very little has been written about it. Even Barclay,[1] in spite of his extensive experience of gastric radiology, does not mention it in his book published last year, and I have been able to trace no references to it in English or American radiological literature. Two references in English have indeed been found, but they are both from anatomical sources. Anderson [2] noted the condition once in examining a hundred consecutive subjects in the dissecting-room, and states that he has not discovered any exactly similar case. Bryce,[3] whose paper I have been unable to consult in Johannesburg, described it as "a rare abnormality in the curvature of the duodenum."

Within the last eighteen months a series of articles on the subject has been published by Sandera [4-6] and up to July, 1933, he has reported in all 10 cases, 2 of which went to operation. I gather from Sandera's papers that another case has been operated on in France by Breton, and in September last 5 more were described by Hürthle.[7] This makes a total of 15 cases in German journals. If the present 11 cases are included the number of published cases still seems to be only about 30.

THE CONDITION AND ITS RECOGNITION

According to Sandera, right-sided duodenum inversum belongs to the congenital abnormality described as "mobile duodenum." The latter he defines as a congenital dystopy due to faulty or partly defective attachment of the duodenal mesentery; in association with it may be found abnormalities of the right kidney, pancreas, portal vein, and transverse mesocolon. True duodenum inversum is described as a transitional type of the duodenum mobile inversum. The duodenum is inverted and surrounds an abnormally shaped head of the pancreas. The duodenum also lies entirely above the transverse mesocolon. Owing to faulty attachment it becomes elongated.

In the two cases which were operated on and reported by Sandera the pancreas was deformed—a point which cannot of course be demonstrated radiographically. It was also demonstrated that the duodenum was above the transverse mesocolon.

The normal duodenum, as described in the textbooks, is divided into four parts: the superior, descending, horizontal, and ascending. Radiographically, one sees the cap just beyond the pyloric canal (Fig. 1, C.). From the cap there is the junction of the first and second parts. The latter passes down to join the inferior flexure—the flexure would correspond to the third part of the anatomists—and the fourth part passes upwards under the stomach to join the duodenojejunal flexure. The ampulla of Vater is generally about half-way down the second part. In relation to these cases this is an important point, the ampulla being found in abnormal positions.

In cases of inverted duodenum the stomach is generally further to the left of the spine than usual, and the cap occupies a more transverse position. At the inferior flexure, the third part, instead of going to the left of the second part, turns up to the right of the second part, and goes on to join or form the duodenojejunal junction which likewise may be abnormally situated (Case 6, Fig. 4).

Now why should the condition give rise to symptoms? As a matter of fact, it need not necessarily do so, and in 3 of the 5 cases reported by Hürthle, there were apparently none attributable to it. The explanation offered by Sandera is that the abnormal position of the duodenum hinders the passage not only of the food from the stomach but also of the pancreatic and hepatic secretions, with the result that pancreatitis or cholecystitis may be set up. There is no general delay in emptying of the stomach, either in the cases reported by Sandera and Hürthle or in

the present series. In only 3 of the 11 recorded here was there any notable slowing of the emptying rate; in the other 8 the stomach was empty within two or three hours. When symptoms do occur they are always referable to the stomach, and in Case 1 (which was operated on) they closely resembled those of a duodenal ulcer. Whether the condition may actually give rise to ulceration it is difficult to tell. In Case 4, although a definite crater was not demonstrated, the appearance strongly suggested a duodenal ulcer, and the patient improved a great deal on an appropriate diet. In the first of Sandera's cases which was operated on there was a history of a previous operation for a gastric ulcer, and Hürthle's five included one of duodenal ulcer and one of duodenal diverticulum.

CASES

A better idea of the symptomatology will be obtained from the following records.

CASE 1.—An undersized man, aged 39. One of a family of thirteen, he states that he is the eldest and the least robust of the lot. His previous illnesses bear no relation to the condition. He first began to complain of indigestion eleven years ago. The indigestion consisted of pain in the pit of the stomach about 6 P.M. It was partly relieved by eating or taking "white mixture." There was an associated feeling of weakness and he used to get severe headaches. He saw various specialists and the various diagnoses were made, ranging from visceroptosis to duodenal ulcer. The condition was finally diagnosed as chronic appendicitis and he was advised to be radiographed. Fig. 2 shows the condition found at the examination. His stomach is low, the cap is regular. There was no sign of any ulcer crater; nor did Mr. Beyers detect any sign of any ulceration at the subsequent operation. The duodenum shows the typical appearance of a right-sided duodenum inversum. At the operation Mr. Beyers found a good many adhesions in this region which he liberated. He also removed a pathological appendix.

His operation was for the removal of the appendix. At the same time, as the duodenum inversum had been reported, the surgeon investigated the right upper quadrant. The operation as carried out and designed by Riess and reported by Sandera is to anastomose the descending portion of the duodenum with the proximal loop of the jejunum. This was done in one of Sandera's cases; in the second case a Braun's anastomosis was added.

FIG. 4 (Case 6).—Abnormal position of duodenojejunal junction.

CASE 2.—A married woman, aged 58, was referred to me by Dr. Duthie, to whom I am indebted for the clinical notes. She is tall and slightly built. For years she has complained of pain in the lower chest with occasional vomiting. Her appetite is good but she has a sense of distension after food and therefore she does not eat. She feels better on a light diet. She has had attacks of severe pain aggravated by cold. The pain occurs about a quarter of an hour after food and is not relieved by more food; nor do alkalis relieve it. Meat and soup aggravate the symptoms. Her general health is otherwise good.

The radiogram (Fig. 3) again shows the typical condition. It will be observed that the stomach is completely to the left of the spine. The duodenojejunal junction is

FIG. 1 FIG. 2 FIG. 3

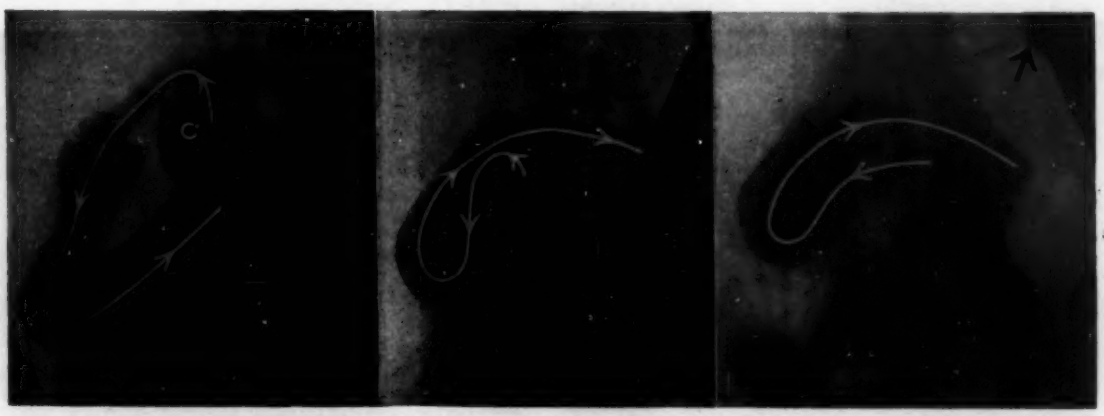


FIG. 1.—Normal duodenum (with diverticulum at the ampulla). The white lines show the direction in which the contents travel from the duodenal cap (C).
FIG. 2 (Case 1).—This and subsequent radiograms show duodenum inversum.
FIG. 3 (Case 2).—Note that all the stomach is to the left of the spine.

The patient was re-examined later, and the appearances were as before; in fact, there was rather more delay at the inferior genu of the duodenum. The patient stated that for a month after the operation he felt a new man. He was eating well, had no pain after food, and could take any type of food without indigestion. He returned to work within a month of the operation and thenceforward the symptoms steadily recurred, though they were not so severe as before.

It should be pointed out that this patient did not have an operation directly for the duodenal condition. formed immediately above the cap. A bulge on the lesser curvature (marked with an arrow) was noticed. The examination was repeated after an interval; the appearances were identical and the possibility of an ulcer could be excluded. A point of interest in this case is that the patient seemed to have a diseased appendix, which has not, however, been removed. Another point was the barium passed very rapidly through the colon, reaching the rectum within six hours. Diarrhœa is often associated with duodenum inversum and Sandera's suggestion is that it may be due to a pancreatitis.

CASE 3.—The patient, a rather short man aged 54, was referred to me by Dr. Pieters. He said he had had indigestion ever since he could remember—even at the age of 15. Everything turned to "acid sourness." He could get relief by making himself vomit. He would get pain over the pit of the stomach. Belladonna and Maclean's powder also gave relief. The acidity usually came on four hours after food and lasted until he took "bicarbonate." After an attack had passed he could eat grilled steak and not have another attack for a week. Here again the typical condition was found on radiography (Fig. 5).

CASE 4.—Another man, referred by Dr. Verceuil, gave a history of indigestion dating back some time. Here there was a strong suggestion of a duodenal ulcer, and the radiogram showed pylorospasm and exaggerated peristalsis. The cap was distorted and an incisura completely encircled it.

This was another case of duodenum inversum, but in the prone position the duodenum had a normal appearance. Sandera reported the same thing in the first of his cases in which operation was performed. The finding supports the classification of the condition under the general heading of "mobile duodenum."

CASE 5.—(Referred by Dr. Douglas.) The radiographic appearances were typical. The patient is a man of 32, and his appendix was removed in 1932 in Edinburgh. There was nothing acute at the time; he complained of a little indigestion, and as he was off colour it was decided to remove his appendix. He was very much better after the operation. Later he began to complain that he could not get his breath properly and that he was tender over the umbilicus. The pain bore no relation to food. During the winter of 1932 he had repeated attacks of diarrhœa. His stools were several times examined but without result. After the X ray examination he was put on Sippy diet and improved for a time. He maintains that *acidophilus* milk cleared up the symptoms completely. He has now very little trouble.

CASE 6.—(Fig. 4.) The sixth patient was referred by Dr. Heimann, who asked whether there was any gastric or duodenal deformity. The abnormal position of the duodenojejunal junction was noted on radiography. (Sandera has collected three similar cases.) He gave an indefinite history of dyspepsia which had persisted for a number of years in spite of treatment.

In the next three cases the patients were women, and as in Case 2 they were all conspicuously asthenic in type. None of them weighed more than 100 lb., and two of them gave histories of frequent bouts of diarrhœa.

CASE 7.—A woman of 42. She said she had always been healthy, up to a year ago, although she had never weighed more than 90 to 100 lb. The present illness started one year ago, after an attack of "dysentery." Since then she has complained of diarrhœa and pain in the abdomen as soon as she eats or drinks anything. There may be as many as twenty to thirty stools a day. She is rapidly losing weight, her present weight being 74 lb. The examination of the fæces was negative for blood and parasites.

CASE 8.—The patient was 59 years of age and the radiographic appearances (Fig. 6) were almost exactly the same as in Case 7. For four years she had been complaining of nausea and loss of appetite and of constipation, alternated with violent purging for two days or more, during which she might have twenty to forty stools a day. She has lost 36 lb. in weight in the last three years.

CASE 9.—A woman of 70, with gall-stones. For many years she had not been quite well and there were vague symptoms of dyspepsia. Because of the gall-stones, however, it is hard to say what part the inverted duodenum played in the causation of symptoms.

The remaining two patients were males.

CASE 10.—Aged 26, the patient was 6 ft. 2 in. in height. He started to complain of pain in the stomach about a year ago. It came on sometimes before food and sometimes after; it was not related to the type of food, although vegetables such as cucumbers made it worse, and it did not wake him at night. He felt better on a light diet. There was no vomiting or diarrhœa. In spite of this indefinite history the symptoms were severe enough to bring him all the way from Bechuanaland to consult a physician in Johannesburg. The photograph (Fig. 7) showed not only the typical appearances, but also a condition resembling duodenal ileus at the point at which the duodenum was crossed by the hepatoduodenal ligament which in these cases goes on to the head of the pancreas. The appearances are thus of an inverted duodenal ileus.

CASE 11.—The radiographic picture was very similar. The patient is 39 and has had constipation since childhood. Eight years ago he began to complain of "acidity" an hour after meals, with a burning sensation in the chest. Food and bicarbonate of soda relieved the burning sensation. There was no night pain. Milk, fruit, and vegetables brought on the pain. He consulted his doctor because of an attack of diarrhœa recently. He has never been very robust and recently has been losing weight.

FIG. 5 FIG. 6 FIG. 7

FIG. 5 (Case 3). FIG. 6 (Case 8). FIG. 7 (Case 10).—An "inverted duodenal ileus."

SUMMARY AND CONCLUSIONS

Eleven cases of right-sided duodenum inversum are described.

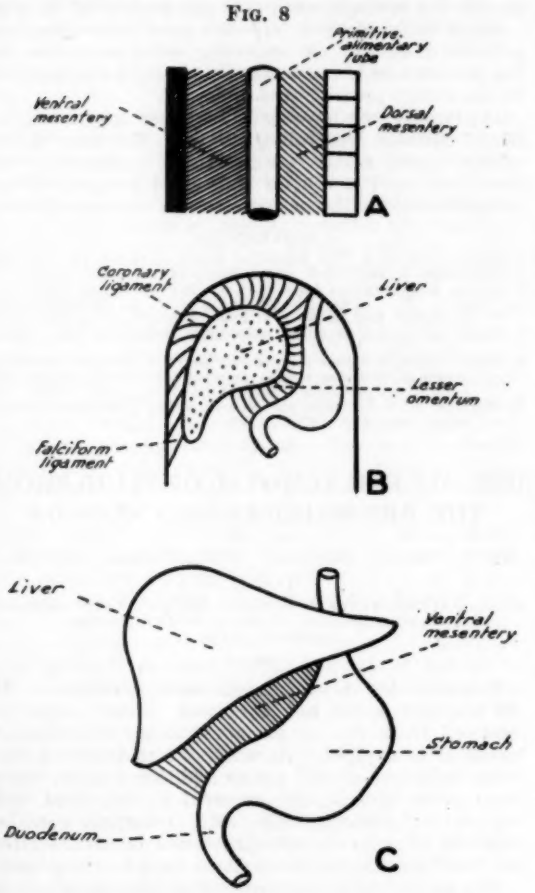
Four of the patients were females, ranging in age from 40 to 70. All of these were asthenic and three of them gave a history of recurrent attacks of diarrhœa. One had gall-stones.

Seven were males, ranging in age from 26 to 54. Their habitus varied more than that of the females,

one of them being 6 ft. 2 in. in height. The others, however, were of the short hyposthenic type. Two of them complained of attacks of diarrhœa.

All the patients gave histories of dyspepsia which had persisted for considerable periods, and in two cases the history was suggestive of duodenal ulcer. In the one patient operated on there was no sign of any ulcer, nor was there any sign of any ulcer radiographically. The existence of the duodenal abnormality was confirmed at the operation. Two of the patients had had their appendices removed, and in another three the appendix appeared to be pathological radiographically.

FIG. 8



It is doubtful whether the condition could be diagnosed with certainty clinically. Radiographically it will be missed unless the duodenum is traced to the duodenojejunal junction. The appearances once seen on the screen cannot be mistaken. The inverted duodenum may return to normal when the patient is put into the supine or prone positions. A complete examination of the full length of the duodenum during the course of barium meal examination would doubtless reveal many more of these cases.

The Developmental Aspect

(*By* MR. MCGREGOR)

It is generally thought that the explanation of inversion of the duodenum may be developmental. Let us examine the known facts.

Development of the duodenal curve.—This portion of the gut is situated in a position possibly more interesting than any other part of the alimentary canal. Its proximal three inches belongs to the foregut, the remaining seven inches to the midgut. The ampulla of Vater is the boundary line between these two areas. At a very early developmental state the alimentary tube is quite straight. Its cephalic (foregut) portion is suspended like the primitive stomach by two folds of peritoneum—i.e., a ventral and a dorsal mesentery (Fig. 8, A). Into this ventral mesentery there grows the liver as a duodenal outgrowth. The outgrowth distends the mesentery and the great growth of the right lobe of the liver by traction on the left umbilical vein displaces the upper duodenum from the midline towards the right (Fig. 8, C).

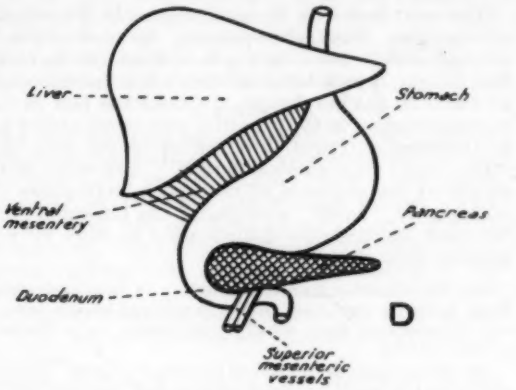


FIG. 8.—(A) Showing the primitive gut suspended by its ventral and dorsal mesenteries.
(B) The remains of these mesenteries in the adult—i.e., coronary and falciform ligaments of liver and the lesser omentum.
(C) Showing how the huge growth of the liver at an early developmental stage pulls on the ventral mesentery (which it distends), and so pulls the duodenum to the right. This is the first stage in the formation of its curve.
(D) The later stage of development where the formation of the head of the pancreas and the rotation of the gut have imparted the final bend which completes the shape of the adult duodenum.

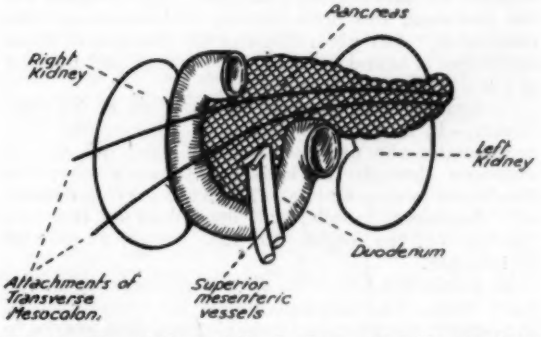


FIG. 9.—The relations of the duodenum and the structures which serve to fix its position. Abnormality in the position or fixation of any of these must react on the position of the duodenum.

We see then that the falciform ligament and the small omentum are the remains of the ventral mesentery (mesogastrium and mesoduodenum) being separated from each other by the great growth of the primitive liver (Fig. 8, B), and, coincidentally, the pancreas develops also as a duodenal outbudding, and

the form of its head is the second factor in the shaping of the duodenal curve (Fig. 8, C).

The next factor in its architecture is the rotation of the gut. This phenomenon, dreaded alike by student and lecturer, is dependant on the fact that the midgut, which forms all the bowel from ampulla of Vater to splenic flexure, develops too fast to find accommodation in the primitive peritoneal cavity and is therefore extruded into the umbilical cord as a "temporary physiological hernia." The order of the return of the contents of the hernia determines the ultimate or "adult" position of the intestinal tube. Without unnecessarily complicating matters we may indicate that:—

(1) The superior mesenteric artery is tautly stretched from aorta to the apex of the umbilical hernia (site of vitello-intestinal duct which may persist as a Meckel's diverticulum).

(2) The cæcum is too bulky to return into the cœlomic cavity so the small intestine returns first, the first part to be reduced being the proximal part of the foregut—i.e., the part of the duodenum caudal or distal to the Vaterine ampulla.

(3) There is no room for this gut on the right because of the huge liver so it is pushed to the left beneath the superior mesenteric artery (Fig. 8, D).

Thus occurs the phenomenon that the third part of the duodenum lies posterior to the artery of the midgut (superior mesenteric), and thus it comes about that the third part of the duodenum stretches across the vertebral column upwards and to the left.

If we add to the above factors the intricate development of the portal vein, we have enumerated the various developmental stages in the formation of the C-shaped duodenal curve. But this is not enough. The duodenum cannot become fixed in place unless its dorsal mesentery disappears. This fuses with the posterior parietal peritoneum and by complicated rearrangements, it ultimately lies on the posterior abdominal wall with almost its entire posterior surface devoid of peritoneum. Finally, and of the greatest moment, is the fact that it cannot occupy a normal position unless the organs which assist in its fixation are also normally situated. Such organs are the pancreas, the right kidney, and the transverse mesocolon. Any aberrations in the position of these structures is bound to affect the position and fixation of the duodenum (Fig. 9).

Abnormalities in fixation and position of the duodenum.—It is a fact well known to surgeons that occasionally the pancreas can be lifted out of the abdomen through the incision. In such cases the duodenum is very mobile. There are varying degrees of "duodenum mobile," all dependent on deficient fixation of the organ to the posterior parietal peritoneum.

In *duodenum inversum*, after a preliminary downward bend, the duodenum trends sharply upward to the *right* of the part bent caudally and then curves to the left at or above the level of the pyloric region. One authority explains the matter as a ptosis, supposing the first and second parts to have sunk below the level of the remainder. Whereas the simplicity of the explanation renders it attractive the view fails to gain general acceptance. It must be appreciated that duodenum inversum is almost unknown to the operative surgeon, therefore we have hardly any anatomical data to correlate with the radiological findings. Until such data are available all suggested explanations are surmise. We may state with reasonable assurance that—

(1) Errors in fixation or position of the right kidney, pancreas, and transverse mesocolon are peculiarly liable to be associated with duodenal malposition.

(2) The fact that it is seen in hypo- and asthenic persons, in whom such malpositions occur, lends support to this assumption.

(3) The less secure the fixation of the duodenum, the more likely is it that it may come to lie in an ectopic situation. As such fixation depends largely on the fate of its dorsal mesentery, we may postulate that persistence of this membrane must be an important factor in displacements of this portion of the gut.

(4) A consideration of the great variability in position of cæcum and ascending colon dependent on the persistence of its dorsal mesentery lends support to the theory promulgated under (3).

(5) Finally, we have here a further application of Bland-Sutton's generalisation that the site of an embryological event (outgrowth of pancreatic and liver buds at junction of fore- and midgut) is the favourite site for the occurrence of a congenital error.

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DRY AIR FOR REMOVAL OF FLUID FROM THE BRONCHIOLES AND ALVEOLI

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EXPIRED air is saturated with moisture. If the inspired air is not saturated, water must be removed from the air-passages to saturate the air before it is expired. As excessive moisture in the bronchioles and alveoli places additional strain upon the cardiac muscle, the removal of this fluid will benefit the patient. The solid materials can be removed later by the administration of alkalis after the heart muscle has been given time to recuperate.

Dry air has been administered to patients in whom signs of excessive pulmonary moisture could be found. Air was given in preference to oxygen as being the natural gas to which the body mechanism is adapted.

METHODS OF ADMINISTRATION

Any method by which the air reaching the alveoli is unsaturated would be suitable, provided the drying effect is not so great that damage occurs to the tissues. In one case the throat became dry and the voice husky, but when the dry air was stopped the trouble ceased.

(*a*) *Funnel.*—Although this method is more comfortable for the patient than (*b*), the air will be likely to absorb moisture in passing through the mouth; it does not, however, become saturated. This method should only be used if (*b*) is impracticable. The funnel is fixed in a suitable clamp over the patient's nose and mouth.

(*b*) *Catheter.*—A convenient method is that devised by G. Bourne[1] for continuous administration

[1] THE LANCET, 1922, ii., 23.

of oxygen. The apparatus consists of a head-band to which is attached a metal plate, placed over the forehead. A metal rod, with a loop at the lower end, is clamped to the plate so that its position can be varied. A rubber catheter (for adults about No. 6 size) is passed through the metal loop into the anterior nares and back to the posterior nares. The catheter should be lubricated with vaseline to which 1 per cent. novocain may be added. The catheters can be left in position for hours, patients eating and sleeping with them in the nose. In one patient I used two catheters, but one appears to be sufficient, the patient inspiring moist air through one nostril. Air reaching the pharynx through the catheter is dry.

Dry air can be obtained from firms who supply compressed gases. A convenient size of cylinder is one containing 40 cu. ft. The air must be ordinary air from which the moisture has been removed; there must be no added substances. If desired, tests may be made for dryness by passing a sample over calcium chloride or copper sulphate. As the quantity of air escaping from the cylinder must be carefully regulated, a fine adjustment tap is required in addition to the usual tap. A rubber tube conducts the air to a gas meter, which may be of the pattern usual in households, on which is recorded the volume of air passing. This meter is timed so that the tap can be regulated to allow a definite volume of dry air to pass each minute. As the pressure in the cylinder falls, less air passes through the meter. The meter should therefore be read every 15 or 30 minutes and the tap adjusted accordingly. Rubber tubing carries the air from the cylinder to the catheter.

The quantity of dry air required for each patient is, at present, indefinite. I obtained improvements with quantities varying from 0·09 to 0·17 cu. ft. per minute, but the cases treated are too few for any final statement to be made. A greater amount might achieve better results. However, I found that if the air be given more rapidly than about 0·2 cu. ft. per minute, the patient complains of coldness in the pharynx, due no doubt to the rapid evaporation caused by the rush of air.

The total quantity of air required for each patient is also at present unknown. Although I have used over 400 cu. ft. for one patient, I think that with further experiments the quantity could be reduced. If the air were given intermittently and the amount gauged accurately, so that the upper level of the moist sounds at the end of one period was lower than at the end of the preceding period, the lungs would be gradually freed from moisture with a minimum expenditure of air. Of course, the upper level of the moisture in the lungs would increase between each treatment, but if it were not allowed to return to its level before the previous treatment, the level would descend towards the base in a so-called "staircase" manner.

I have always used the cylinders at room temperature, as the remaining air which the patient is inspiring through the other nostril is at this temperature, but experiments upon this point might improve the efficiency of the treatment. It is possible that by warming air the coldness experienced in the pharynx when over 2 cu. ft. were allowed to flow each minute would not be felt. Thus a greater volume of air could be used in a given time and the pulmonary moisture removed more rapidly.

(c) *Administration in a room.*—A third method of administration, which I have not used, would be to diminish the water-vapour of the air in the room. To achieve this, the temperature of the room should be kept high, and all heavy materials likely to exude water-vapour should be removed. Air entering the room should not come direct from out-of-doors, and the windows must therefore be closed, ventilation taking place through the door and chimney. A hygrometer must be kept in the room.

RESULTS

The method used for recording results consisted of examining the patient's back, in the sitting posture, every few hours and of marking with a skin-pencil the upper level of the adventitious sounds. This procedure was followed both when dry air was being administered and when ordinary air was being inspired. Changes in quantity and quality of the sounds and in the general condition of the patient were also recorded. If the patient is too ill to be sat up, only the anterior aspect of the thorax can be examined.

Types of results obtained are illustrated in the following cases:—

(a) *Lowering of Upper Level of Adventitious Sounds.*

Before treatment moist sounds were heard over the whole of the left lung and on the right side from about 5 in. below the pulmonary apex. Dry air was commenced (funnel method) at 4 P.M. At 6.30 P.M. (150 minutes later) the upper limit on the left had fallen 3 in., and 30 minutes later the air was stopped and recommenced 2 hours afterwards. It was given for 60 minutes. The upper level of the adventitious sounds remained on the left, 3 in. below its original level. At 11 P.M. the air was recommenced and by 11.30 A.M. on the following day the level of the sounds had fallen 2 in. more. The dry air was finally stopped at 9.30 A.M. on the next day. There was no further improvement. The average dose was 0·14 cu. ft. per minute.

(b) *Improvement in Distribution of Adventitious Sounds and Diminution of Intensity.*

Before treatment, crepitations were heard on the right side from the base up to 6 in. below the upper border of trapezius near the spine and up to 3 in. below the same border laterally. On the left side their upper limits were 7 and 5 in. respectively. One hundred and thirty-five minutes after the commencement of the treatment there was no change on the left side; on the right the crepitations had fallen an inch laterally, but had risen half an inch near the spine. At 5.35 P.M. (5 hours 20 minutes after commencement) the level showed no change on the left, but the sounds were so faint that they were scarcely audible. On the right side their level had fallen another inch. The air was stopped 6 hours 10 minutes after commencement. The sounds in the left lung were still scarcely audible, whereas those in the right lung had fallen 1¼ in. more laterally and all sounds had become fainter. There was thus a total fall of 3¼ in. in the upper level of the sounds in the lateral part of the right lung.

Five hours and five minutes after cessation of the treatment the sounds in the left lung had again become audible. Near the spine they were an inch above the initial level but there was no change laterally. On the right side they had also become louder again and were 2 in. above the original level near the spine, and an inch above laterally. The final observation was made 27 hours 50 minutes after the dry air had been stopped. The sounds were then the same in quality and position as before treatment on the left side and also the same laterally upon the right side, but near the spine they were an inch above their initial level.

This patient showed other improvement also, in that periods of easy breathing of from 5 minutes' to 3 hours' duration occurred after the treatment; these had not occurred during waking hours since the patient had first gone to bed one month previously. Before the treatment the dyspnœa was so severe that the patient had to inspire deeply between words. After treatment these deep inspirations were necessary after sentences only.

(c) *Improvement in Bronchitis.*

Before treatment sibili were present all over both lungs with sonorous rhonchi at each base. After administration

of dry air for 130 minutes, the sibili had disappeared and the sonorous rhonchi were quieter in character. Two hours and ten minutes later the air was stopped and examination 45 minutes after showed that there was no further change on the right side, but the sounds were fainter on the left and had fallen an inch. At 9.30 P.M. dry air was recommenced and stopped at 1 A.M. the following morning. At 11.30 A.M. on this day there was no change on the right side from the examination during the administration of the air, but on the left side the only adventitious sounds present were in a horizontal band whose upper margin was 1¼ in. below the apex of the lung and whose width was 2 in. During the period of the treatment an average of 0·088 cu. ft. was given each minute.

Dry air was again given from noon to 6 P.M. At 2.45 P.M. the crepitations in the medial part of the band and below the band were faintly audible. There were none at the base. On the right side the adventitious sounds covered the same area but were quieter. The average quantity of air administered was 0 114 cu. ft. per minute. Cyanosis was less on this day than on the day previous. Eleven hours after the cessation of the air the sonorous rhonchi had returned at the left base and sibili were again found all over the right lung. Finally, dry air was administered for 5 hours at an average speed of 0·17 cu. ft. per minute. The adventitious sounds became fainter in the left lung and the dyspnœa diminished.

REMARKS AND SUMMARY

Dry air is capable of removing signs of fluid from the bronchioles and alveoli. This action reduces the pressure in the lungs and thus relieves the cardiac musculature. The dry air does not, however, prevent further fluid from passing into the air-passages after the termination of the treatment. The treatment can be of permanent benefit only by giving the heart muscle periods of comparative rest in which to recuperate. In consequence, dry air should be administered frequently over a prolonged period, perhaps of days or weeks. The duration of each administration should be of some hours, and at least 0·1 cu. ft. of dry air per minute should be given. The total quantity to be used, the intervals between doses, and the length of each administration are matters for further experiment.

My thanks are due to Dr. G. F. Barham, medical superintendent of Claybury Mental Hospital, and to Dr. S. Elgee, late medical superintendent of Cane Hill Mental Hospital, for their permission to treat cases. Also to Sir Charlton Briscoe for his kind interest.

ON THE PREVENTION OF MINERAL OIL AND TAR DERMATITIS AND CANCER

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THAT contact of man with mineral oils and tars is instrumental in leading to certain forms of industrial dermatitis and cancer had been shown conclusively, both clinically and experimentally, before we began our investigation of the subject some seven years ago. One of the most important aspects which we had to consider was the finding, if possible, of a means of prevention, so that workmen unavoidably exposed to oils and tars should have these industrial risks reduced to a minimum. In this we have been fortunate enough to have a substantial measure of success, although many more experiments have to be completed before we can be satisfied that further investigations are not worth while. Some of our earlier work has already been published, and we feel that certain results obtained more recently are of such interest that they should now be briefly recorded. Details of the experiments will be given in a subsequent and more complete paper.

QUESTION AND ANSWER

The problems we set out to solve, with the results forthcoming from our experiments, will now be described in a few lines, although it must be understood that many thousand animals were involved in the carrying out of each group of tests.

1. Are some grades of mineral oils more carcinogenic than other grades? We were able to show conclusively that, on the whole, the textile grades were the most carcinogenic; internal combustion engine lubricating oils being relatively of low carcinogenicity, while the so-called "spirits," although capable of causing dermatitis, in our hands induced no cancer-formation among the animals tested. Thus the "bright," refined textile lubricating oil is almost certain to be more carcinogenic than the dirty-looking crude from which it had originated.

2. Have all crude mineral oils potentially an equal degree of carcinogenic activity? The results of tests on animals of numerous samples of oils obtained from different parts of the world indicated in no uncertain fashion that there was a great variation in the yield of tumours according to the geographical area from which the oil sample had originated, there being also a lesser degree of variation among a number of samples specified as having originated from a single area. Broadly, the more fully hydrogenated an oil the less was its carcinogenic activity. The selection of lubricating oils from their origin alone was thus of value to the user wishing to avoid skin cancer, &c., among his employees.

3. Can the carcinogenicity of mineral oils be reduced by suitable treatment, so that they still remain good lubricants, and the treatment entailed be practicable commercially? We have found that by suitable treatment of oils with sulphuric acid and with a variety of extractives their carcinogenicity can be reduced to an extent running more or less parallel with the severity of the treatment used, until the carcinogenic potency becomes zero. From the commercial point of view the sulphur dioxide treatment (Edeleanu process) appears to be the most practicable. Five such commercially treated oils have up to the present yielded no tumours among our animals. In general terms any process which tends to hydrogenate or saturate the oils, such as oxidation-reduction, polymerisation, or selective extraction, will decrease the carcinogenic activity of such oils.

4. Is it possible to supplement the animal test by an examination of the physical and chemical characteristics of mineral oils? With our collaborator, Mr. R. Lyth, we have found that the refractivity constant of a given mineral oil is, within limits, closely related to the carcinogenic potency of that oil, so that in most cases where our advice is sought we no longer consider it necessary to carry out an animal test. A tedious, lengthy, costly, and necessarily variable test (animal variation) is thus replaced by one far better in all four respects. The Edeleanu treatment profoundly lowered the refractivity constant of the oils tested. The selection by the user of oils according to our recommendations should reduce mule-spinners' cancer practically to zero.

5. In the commercial production of mineral oils many workmen must unavoidably come into contact with highly carcinogenic crudes. Can any sort of protective measures be adopted in order to minimise their risk? Our early experiments indicated that a mixture of anhydrous lanolin and olive oil offered a remarkable degree of protection to animals placed in contact with mineral oils. Numerous subsequent experiments have failed to reveal any other ointment of similar efficacy, so that for the prevention of mineral oil dermatitis and cancer we still advocate, as we have done for the past years, the smearing of exposed parts with a mixture of equal amounts of anhydrous lanolin and olive oils before commencing work in the morning and after the evening bath. The practical utility of lanolin has, on our recommendation, been tested by a large oil company, and we have received during the past three years highly favourable reports, both from the point of view of the employer and of the employee, on the profound reduction in the incidence of the skin troubles formerly so prevalent. We daily learn that an increasing number of firms, in which mineral oils are utilised for varying commercial processes, are taking advantage of our recommendations, and it is to be hoped that, where practicable, the treatment will very shortly become general.

6. Is lanolin equally efficacious in preventing the dermatitis and cancer arising from exposure to gas tars and their products? It is primarily in order to answer this question that we felt the necessity of writing the present note. Despite the number of inquiries we have had on this subject we have so far refrained from expressing an opinion in public, owing to the conflicting nature of the experimental results we had available. We have now, however, an amount of confirmatory evidence in support of our early experiments sufficient to warrant our giving definite recommendations to all those interested. Despite the fact that the utilisation of lanolin, separately or added to pure gas tars, as a rule increases instead of decreasing the yield of tumours among our animals, we have no hesitation in recommending our mixture of lanolin and olive oil for the prevention of tar dermatitis and cancer. The admixture of small quantities of lanolin to dilute gas tars may result in an enormous increase in the tumour yield, and yet we deem ourselves safe in recommending man to utilise lanolin. As we have already remarked, we cannot here go into details of individual experiments. It will suffice perhaps if we say, in order to give confidence, that we have utilised some 10,000 animals in an endeavour to elucidate this question. The logical deduction from a close scrutiny of our results leaves us no choice but to recommend the use of lanolin among tar workers, but we are of opinion that further experiments will enable us to amplify our recommendations at a later date.

PRACTICAL APPLICATIONS

The following suggestions are made to those interested in mineral oil and tar dermatitis and cancer. (1) Take special precautions with textile grade oils. (2) Select well-hydrogenated oils, as provided by certain oil-bearing areas. (3) The refiner should subject oils to the Edeleanu process when necessary. (4) Select oil with a low refractivity constant. (5) Use lanolin-olive oil protective ointment before work and after evening bath.

If our recommendations, where applicable, were correctly followed, mule-spinners' cancer and allied conditions should, in our opinion, soon become curiosities.

NEW METHOD OF
LOCAL ANÆSTHESIA FOR ABDOMINAL OPERATIONS

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Although in the last few years abdominal surgery has made considerable progress, very often the surgeon is faced with problems regarding the low general condition of the patient, or with diseases which have no direct connexion with the operation itself but which handicap its performance. Often it is impossible to administer a general anæsthetic because the condition of the heart or some other organ makes it dangerous. When an attempt is made under these conditions the success of the operation is very doubtful. Moreover, the result of an operation on normal people is compromised by many post-anæsthetic complications. For these reasons many surgeons prefer a spinal anæsthesia.

Without criticising in detail the advantage or disadvantage of spinal over general anæsthesia, I would only say that in no circumstances where a special low condition of the patient makes the use of the general anæsthesia dangerous is the surgeon entitled to use spinal as an alternative. Operative statistics are full of the unsuccessful results of operations due only to the misuse of spinal anæsthesia. I have myself observed cases of simple operations, such as appendicitis or hernia, where the result has been fatal solely on this account.

For these and other reasons I have tried to bring to perfection a new method of local anæsthesia which not only completely dispenses with the disadvantages of the two above-mentioned types, but which also allows the same possibility of performing the operation. By the exact performance of my method it is possible to bring the patient into a complete state of insensibility and relaxation, and any work on the abdominal organs is as easy as with a general or a spinal anæsthetic. It can also be administered to patients in any state of debility or disease. My experience with this anæsthesia extends over more than 500 major and minor abdominal operations. The success has been absolutely certain, and I have had no fatal results due to the anæsthetic itself. Partial resection of the stomach for carcinoma or chronic ulcer has been performed on patients over seventy years of age and total hysterectomy on patients with far advanced heart or kidney diseases, where a spinal or general anæsthesia would have been fatal. In all cases the local anæsthesia has brought complete insensibility, and very rarely has it been necessary to inject it a second time.

PREVIOUS FORMS OF LOCAL ANÆSTHESIA

It was thought at one time that an infiltration of the abdominal wall with a weak solution of novocain would be enough for any kind of abdominal operation. Reclus and Schleich claim to have obtained complete anæsthesia with this simple infiltration. They say that the abdominal organs are insensitive. Their procedure was as follows: first of all the skin had to be made insensitive with a ½ per cent. novocain solution. After having infiltrated the subcutaneous tissue, they pierced the external muscle fascia and injected 50–100 c.cm. of the same solution. The experiments of other surgeons demonstrated, however, that very few patients could stand the operation, and

then only when it was performed on a superficial organ near the anterior abdominal wall. In most cases, particularly when the whole abdominal cavity had to be explored, this method of anæsthesia was not enough. The sensibility and the pain were so great that it was impossible to carry out the operation.

A slight improvement was made by H. Braun, who modified the procedure of infiltrating the abdominal wall. Instead of proceeding from the skin towards the muscle fascia, Braun pierced the whole of the abdominal wall with the needle and, arriving underneath the internal muscular fascia, he injected a large quantity of novocain solution into the space between the aponeurosis and the peritoneum. As the tissue in this part is very loose the infiltration proceeded rapidly and a large area of the anterior portion of the peritoneum was brought into complete anæsthesia. This method, however, was also not sufficient for all patients and could not be universally adopted. Braun admits this and recommends as an additional help the so-called branch-anæsthesia. This consists in numbing the sensibility of the abdominal wall, including the peritoneum, through blocking the intercostal and lumbal nerves of both sides. The procedure is as follows:

The patient is placed on his back. After finding the tip of the twelfth rib a line is taken uniting this point with the fifth rib and the superior anterior iliac spine. Proceeding along this line one injects into each intercostal space, and also into the space between the twelfth rib and the iliac spine, a small quantity (10 c.cm. for each injection) of novocain solution. In this way the 5th–12th intercostal, ileo-hypogastric, and ileo-inguinal nerves are blocked, and this results in complete anæsthesia of the abdomen. This method has been widely adopted, and many authorities such as Franz, Adam, and Bier claim extraordinary results.

As an alternative to this, Kulenkampf, Hesse, Stenglein, and others have recommended another additional procedure for obtaining complete anæsthesia. Referring to the fact that it was principally the omentum and the mesentery which were sensitive, some of them advised a secondary infiltration of these organs after opening the abdominal cavity. In this way they obtained the required insensibility for the performance of the operation. Kulenkampf, instead, when he had to work on these sensitive parts gave ethyl-chloride narcosis for a few seconds.

A still further improvement in local anæsthesia for abdominal operations was made by splanchnic anæsthesia. It was observed by Kappis and Neumann that all the sensibility and consciousness of pain in the organs of the upper portion of the abdomen depend on and are transmitted through the major and minor splanchnic nerves. Both of these, at their entrance into the abdominal cavity, lie close to the aorta underneath the lesser omentum on the posterior abdominal wall. At the height of the cœliac artery they enter the cœliac plexus. This area is accessible for the needle from both sides of the abdomen. The injection through the posterior abdominal wall is made as follows:

The patient is on his side. At a point 7 cm. distant from the spinal processes and below the twelfth rib the skin is pierced with a long needle in the direction of the spinal column until this is reached. After that 20–40 c.cm. of novocain-suprarenin solution is injected. This produces anæsthesia of both splanchnic nerves and of the cœliac plexus, and so of the organs of the upper portion of the abdomen.

This way of reaching the splanchnic nerves through the posterior wall is very dangerous and has therefore been abandoned, but the infiltration of the area from the front is easier and without danger. When the abdomen has been opened, the surgeon feels with the forefinger of the left hand for the spinal column immediately below the diaphragm. On the right side of the aorta, by the guidance of the finger, a long needle is introduced until the bone is reached. This done, the same quantity of fluid (20–40 c.cm.) is injected.

Without describing all the more or less similar additional methods, I should like to draw attention to that of Frigyesi and Traugott. They claim to have performed successfully large numbers of operations in the lower portion of the abdomen (hysterectomy, oöphorectomy, &c.), using additional anæsthesia of the sympathetic parasacral nerves.

AUTHOR'S TECHNIQUE

The procedure I employ is as follows: On the day before the operation the patient is prepared as usual. One hour before the operation he is given hypodermically a combined injection of morphia and scopolamine in the proportion of gr. ¼ to gr. 1/100. Half an hour later most of the patients are in a condition of twilight sleep. The operative field is injected hypodermically with 1 per cent. novocain solution to form a rhombus, as shown in the Diagram.

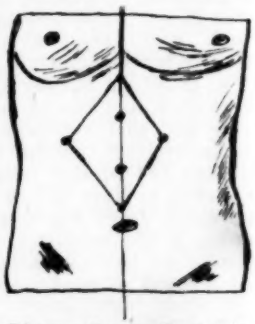

Diagram showing the points of injection.

The injection of the fluid is made through two opposite points equidistant from the line of the incision and radiating over all the field of operation. The needle is then introduced vertically at two points on the line of incision itself, until it pierces the internal muscle fascia. At each of these points 20 c.cm. of fluid is injected. The fascia is not difficult to feel because it offers a resistance to the needle which gives a special sensation to the fingers. Ten minutes after this procedure the field is completely insensible.

When the skin and muscle have been cut and the peritoneum exposed, instead of opening it the whole length of the wound a small incision is made about two inches long, through which 200 c.cm. of ½–¾ per cent. novocain solution is poured into the abdominal cavity. It is now necessary to wait for five or ten minutes before proceeding with the operation. After this the peritoneum is opened and the necessary operation performed. This completed, the superfluous fluid is taken from the abdominal cavity by means of swabs or a suction pump.

If every detail of these instructions is observed precisely, it is possible to bring the peritoneum and the abdominal organs into complete relaxation and anæsthesia. The intestine is paralysed, no kind of peristalsis can be observed, and the work on any of the organs is easy. For hysterectomy it is advisable to inject a little of the fluid on both sides of the uterus between the two folds of the large ligament. This prevents the slight sensation which some patients have when the ligaments of the organ are being cut and ligatured.

The insensitiveness of the abdominal wall and organs remains for about two hours and therefore any kind of operation can be performed. The local anæsthetic itself has no effect of any kind on the patient, no matter what his or her general condition. The paralysis of the intestine consequent to the anæsthetic is very easily removed by stimulants such as pituitrin and esserin. The poisoning due to the absorption of the novocain, to which some surgeons

have objected, need not be taken into consideration. Absorption of fluids through human tissue proceeds very slowly, and therefore during the time which is taken by the operation it is impossible for it to penetrate in such quantity as to become dangerous. If, incidentally, when making the hypodermic injection some vessel is punctured and the fluid thus comes directly into the circulation, no ill-effect arises.

In conclusion, I cannot emphasise too strongly the advantages of this type of anæsthetic over spinal, and in my opinion it should always be adopted for patients who, for some reason or other, cannot stand a general anæsthetic.

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A CASE OF "SPLANCHNOSTAXIS"

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ON March 29th, 1933, a labourer, aged 31, got out of bed at 7 A.M. and was seized with pain in the left upper abdomen, making him feel sick. Vomiting gave relief, and after a short rest he went to work without discomfort until noon, when the pain and nausea returned. He went home by bus and was then taken in a motor-car to hospital where he was admitted at 2 P.M.

There was no history of injury. His general health had been good, except for repeated attacks of what he called indigestion for the last few months. The pain however had had no relation to food, had never been severe, and had not prevented him from working. The only occasion on which he had consulted his doctor was the evening before this attack, when he complained of deafness and had some wax removed.

On admission to hospital it was noted that he was a well-developed man of healthy appearance. Temp., 97·6° F.; pulse, 90; resp., 22. There was some rigidity in the left hypochondrium, without tenderness. The liver dullness was not increased, the splenic dullness was normal, and no free fluid could be made out in the flanks. At 6 P.M. his general condition was worse; the pulse had quickened and there was now general abdominal rigidity, especially on the left side, with some tenderness. An hour later the abdomen was opened through a high left paramedian incision. The peritoneal cavity was found full of blood mixed with peritoneal effusion—the condition was, in fact, like a ruptured ectopic gestation. After repeated mopping the stomach, duodenum, pancreas, liver, and spleen were found to be normal. Multiple small discrete hæmatomata were noticed in the substance of the great omentum and mesentery. Two small bleeding veins near the hilum of the spleen were ligatured. The abdomen was closed, a drain being left in a suprapubic stab puncture.

No improvement followed the operation, in spite of saline infusion and the administration of hæmoplastin. At 2.30 A.M. on March 30th there was sudden bleeding from the tube, and again at 6 P.M. Vomiting became persistent, but there was no sign of blood in vomit or stools. Death occurred at 12.30 A.M., March 31st.

The autopsy threw little light on the case. Stomach, duodenum, pancreas, liver, gall-bladder, kidneys, suprarenals, intestines, and bladder were all normal. The capsule of the spleen was intact, and there were no subcapsular hæmorrhages. The two small veins which had been ligatured were outside the splenic hilum, and had probably been torn during manipulation of the spleen at operation. There was no mesenteric thrombosis; no evidence of purpura. Nothing but the hæmatomata in the substance of omentum and mesentery.

We have not met with, or read of, a similar case. Epistaxis, gastrostaxis, and metrostaxis occur without known cause—it is called "spontaneously"—and may be fatal, although post mortem it may be impossible to find any bleeding vessel which could have been ligatured. In this case similar bleeding seems to have occurred from minute splanchnic vessels, the cause being equally unknown. The title used for this paper is intended to provoke discussion.

NEW INVENTIONS

AN IMPROVED ASEPTIC ARTIFICIAL PNEUMOTHORAX APPARATUS

THIS apparatus was designed for four purposes: (1) injection of any quantity of air into the chest, (2) easy manipulation, (3) portability, and (4) easy sterilisation. Air is introduced through a filter by means of a pressure bulb, the quantity being measured in the usual way by displacing water from one bottle to the other. When one is full the tap is turned in order to reverse the water to the other bottle. This can be done indefinitely and any quantity of filtered air can be injected; this is especially useful in replacing an extensive pleural effusion. By means of a second tap the air can be directed into the pleural cavity, or the latter can be connected with the water manometer to ascertain the intrapleural pressure. As the bottles are only 500 c.cm. in capacity the apparatus is therefore small and portable. All taps are metal and the whole apparatus can be sterilised by boiling. The operator can control the rate of the injection of air and manipulate the manometer tap with one hand, the other hand being left to steady the pneumothorax needle in the chest. As the apparatus is automatically filled with air during each injection, it is ready for use at the end of each refill and is therefore convenient for clinics where many injections are required.

Messrs. Down Bros., of 21–23, St. Thomas's-street, S.E., are the makers.

Aberdeen. ROBERT J. DUTHIE, M.D.

THE SERUM TREATMENT OF LOBAR PNEUMONIA

A REPORT OF THE THERAPEUTIC TRIALS COMMITTEE OF THE MEDICAL RESEARCH COUNCIL

DURING the last three years the Medical Research Council have assisted an inquiry at different centres in Great Britain into the therapeutic value of specific sera for lobar pneumonia, following the great development of similar work in the United States. When the Council appointed a standing Therapeutic Trials Committee in 1931, the investigation was placed under the control of that committee, and the present report summarises the evidence obtained.

The work has been laborious; for it was little more than a critical testing for practical use of methods which were already in common knowledge, and it involved the close consideration of a very large number of cases of pneumonia. The Council wish to express their gratitude to the workers who so willingly undertook this prolonged study and brought their results together for joint consideration.

Interest in the treatment of pneumonia has for many years been felt more keenly in Scotland, where the disease is perhaps more prevalent in the winter months than in England. For evidence used in the present report the committee are indebted to workers in Aberdeen, Edinburgh, Glasgow, and London. The observations at Edinburgh were made by Prof. D. Murray Lyon and the other physicians to the Royal Infirmary; those at Aberdeen by Prof. Stanley Davidson, Dr. J. B. Ewen, and Dr. R. J. Duthie, in the City Hospital, Woodend; and those in London by Dr. R. R. Armstrong and Dr. R. Sleigh Johnson in various London County Council hospitals, and also at St. Bartholomew's Hospital. The Glasgow inquiry under Dr. John Cowan, Dr. A. W. Harrington, and Dr. R. Cruickshank, was developed independently with support from the Scottish branch of the British Red Cross Society, but permission has kindly been given for the use of their results. Separate reports have been, or will be, published independently by these various workers. The present summary expresses opinions agreed upon at all four centres. The practical conclusions are based directly on the evidence obtained there, but it will be evident to anyone familiar with American work that they are not widely dissimilar from those accepted in New York and Boston.

During the two winter seasons, 1931–32 and 1932–33, a total of 773 cases of lobar pneumonia between the ages of twenty and sixty years were studied at Aberdeen, Edinburgh, and London. Of these, 530 belonged to either Type I. or Type II., and 241 were treated by serum. The figures for Glasgow for 1930–33 were 602 cases from twenty to sixty years old, of which 434 belonged to Type I. or II., and 107 were treated by serum. It will be noted from what follows that a large series of cases is required in order to demonstrate fairly any beneficial action of the serum.

Typing of the Pneumococcus

Typing of the organism was generally done on the fresh sputum, selecting that which was of a glairy (rusty) "pneumococcal" appearance rather than purulent expectoration. Lung puncture was rarely used. Sputum up to 24 hours old may be employed, but it is less satisfactory and was never employed in the present series.

The rapid method recommended by Armstrong of immediate typing from the sputum itself on a microscope slide was employed tentatively. This offers great advantages, not only in speed, the test requiring less than half an hour, but still more in that it can be used in places which are not licensed for experiments on animals. But it may be unsatisfactory with the horse sera that are usually provided for type testing, and most workers are agreed that a clear result under the microscope is more often obtained when rabbit sera are employed. The Glasgow observers, however, have compared the results with concentrated horse serum and with rabbit serum, and conclude that these are equally reliable, provided that the serum, whether of horse or rabbit, has an agglutinin titre of, say, 1/160–1/320.

In every instance in the present series, excepting a few of Dr. Armstrong's group, the final typing was recorded on the result of animal tests, Sabin's method of examining the peritoneal exudate four hours after inoculation into mice being generally used, and if that failed the examination being completed later when the mouse was dead or moribund. Whatever the method used, some special experience is required for accurate results, and it should be ascertained that the diagnostic sera are reliable. More than one specimen of sputum should be examined to confirm the type.

Serum Used

The therapeutic antisera were those made for the market either by the Lederle Antitoxin Laboratories, or Messrs. Parke, Davis and Co., or Messrs. Burroughs Wellcome and Co.; the Council and the investigators are indebted to these firms for special facilities given in the supply of the sera. Almost all the observations were made with concentrated serum, the power of which to protect mice had been measured in the American Felton units.

It is clearly desirable that any further evidence as to the value of antipneumococcal sera shall be based on dosage expressed in stable and generally accepted units. During the progress of this investigation, action to facilitate such uniformity of notation in this country has been taken by the Standards Department of the National Institute for Medical Research. Suitable antipneumococcal sera of both Types I. and II. have been dried and are preserved under conditions ensuring permanence, the value of each having been measured in terms of the Felton unit, unofficially current in the U.S.A., by comparison with samples supplied for this purpose by Dr. Felton himself. Of these provisional British standards, that for Type I. serum has for some time been on regular issue to the manufacturers of antipneumococcal sera for sale in this country, and a similar distribution of the Type II. standard will shortly follow. Pending an international decision, and subsequent official action, this voluntary distribution should ensure that data relating to the dosage of antipneumococcal sera from different sources should be strictly comparable both here and in America, where a similar voluntary adoption of the Felton units is effective.

The serum has been given intravenously in all the cases under review. Intramuscular injection was found by some workers to cause painful swelling, and has the theoretical disadvantage that the antibodies may not be absorbed into the circulation as quickly as is desirable.

The beneficial action of serum, which is so conclusively evident in mice, is believed to be sharply specific for each type of pneumococcal infection. American evidence on this point was accepted, and accordingly no attempt was made in this inquiry to learn whether the benefit produced in the human patient might not be equally well obtained by treat-

ment with simple horse serum or with a non-specific type of antiserum.

The treatment with serum was begun as early as possible, though in some instances the patients were first allowed several hours' rest in hospital to recover from the exhaustion caused by transport. If the infecting pneumococcus could be typed without many hours' delay no serum was given until the answer enabled treatment to be started at once with the appropriate antiserum. Otherwise a preliminary dose of 20,000 units of Type I. together with 20,000 units of Type II. was given; and subsequent treatment adjusted to the proper serum or abandoned in accordance with the type of pneumococcus ultimately found. The routine injection of the single specific serum was usually 20,000 units repeated about every eight hours or at least twice in a day. If the patient showed no clinical improvement after 48 hours' treatment with serum, it was generally found to be useless to continue with it. But some severe cases which were beginning to improve but had not yet reached safety received more prolonged treatment. The total dosage of serum varied from 50,000 to 120,000 units in different cases; Type II. cases on the whole seemed to require a larger dosage than Type I. After the fifth day of the illness it was generally felt, though not proved, that serum had no further useful action.

Very few instances of immediately harmful reaction to the serum were ever observed either at Glasgow or Aberdeen. When these occurred they took the form of slight dyspnœa with tachycardia; the dyspnœa was immediately relieved by adrenaline. In both winter seasons there were at Edinburgh and London several instances of alarming, though not fatal, reactions to the first injection of a few batches of a mixed I. and II. serum. These ill-effects were rigors, or dyspnœa and increasing cyanosis, or general collapse with a feeble pulse. Such reactions were considered to be "toxic" rather than "anaphylactic," for they were seen in several patients treated with a particular batch of serum, rather than in an occasional sensitive individual; they were worse the larger the amount of serum injected, and they were not alleviated by adrenaline. When a particular batch of serum was once known to be clinically "safe," it could be used on any patient with no further precaution than that of slow injection into the vein.

Delayed serum reactions were rare and slight with the concentrated sera. During the recent winter Dr. Armstrong in London used an unconcentrated "Wellcome" serum of high titre, which was one-third less costly. This unconcentrated serum was also tried to a small extent at Glasgow. Neither it nor the concentrated "Wellcome" serum ever caused severe immediate reactions, but the use of the unconcentrated product was more frequently followed by late effects such as rashes, swollen joints, and pyrexia. The unconcentrated serum appeared to be as effective as the concentrated form in controlling the pneumonia, provided that the same number of Felton units was given.

Taking the market price of the concentrated serum as 30*s.* for a phial of 20,000 units, the treatment of an ordinary case of lobar pneumonia with 80,000 units would cost £6.

Selection of Cases for Treatment

The good results of insulin on patients with diabetes or of liver treatment in pernicious anæmia are so constant that the trial of these remedies in a very few cases was enough to establish their value. With the antiserum treatment of lobar pneumonia the conditions are very different. The action of the serum is only that of a partial factor for good, and its influence may be overwhelmed by an infection that has been allowed several days to establish its dominance in the patient, or by other complicating factors that weaken the patient's resistance. In order to measure precisely what this partial benefit may be, it would be necessary to take two groups of cases of identical severity and initial history and compare the sickness and the fatality in each, the one being treated with serum and the other serving as a control. But this is impracticable, for few cases even of "Type I." lobar pneumonia are quite alike, and a sufficient number of similar cases could never be got together under one observer and under similar conditions. Some American workers have sought to avoid this difficulty by using a special system of ratings for the various harmful features of the disease, thus expressing each patient's numerical value in reference to a common standard. Such differentiation seemed too intricate, and perhaps too much a matter of personal judgment, for the present inquiry. If a straightforward comparison of treated cases with controls, under the average conditions whereby patients succeed one another in the wards of a hospital, could not reveal any advantage for those treated by serum, then common sense would conclude that the use of this remedy should be disregarded in the routine of practical medicine. The method consequently agreed upon for London, Edinburgh, and Aberdeen was that alternate cases of lobar pneumonia, taken simply in the order of their admission to hospital, should be used respectively for serum treatment and controls. So far as possible both were treated in the same wards and under the care of the same physicians. In the independent inquiry at Glasgow, however, the "serum" cases were treated in the Royal Infirmary, and a series of patients of the same social stratum, admitted during the same period to the Belvidere Isolation Hospital under the care of one physician, served as the control group. It is clear that there may be serious fallacies in any system which contrasts a group of serum-treated patients with a control group drawn from a different stratum of the population, or with a control group in a previous year when the severity of the prevailing pneumonia might have been different.

Certain principles of selection were laid down so as to make the data derived from the centres homogeneous, and to exclude from the comparison patients in whom the serum could not be expected to have any effect. For the latter reason all patients admitted later than the fifth day of illness were excluded from the inquiry. Also, all patients dying within 24 hours of admission to hospital were then taken out of the series, though the evident severity of their illness would not have prevented their inclusion at first, either in the control or serum group. No case of pneumonia complicated by other obvious disease, such as gross nephritis, advanced heart disease, or diabetes was accepted for either group. All forms diagnosed as broncho-pneumonia were also excluded. That these limitations were desirable was agreed upon by all the workers at a preliminary conference on the subject. It will be appreciated, however, that, with such restrictions, it was difficult in three years to obtain fully adequate data for statistical purposes; thus, to take the Aberdeen figures as an example, 450 patients with pneumonia were admitted to the City Hospital, Woodend, during the period under review, but with the agreed limitations the

number was reduced to 188, of which 70 were Type I. cases, giving a total of only 35 available for treatment with Type I. serum.

Sex was disregarded, but the question of age was too important to be neglected Table II. from the present series illustrates afresh the well-known fact that the fatality of lobar pneumonia tends to be much greater over the age of 40 than in younger persons. The fortuitous inclusion of a few more elderly patients in one group than in the other might influence unfairly the final figures for comparison. It was therefore decided to omit from the series all patients under the age of 20 and over the age of 60, and to classify the remainder into broad age-groups. It will be noted that this plan still left altogether unregulated the chance scatter of distribution of patients with severe or mild pneumonia into either the serum or control groups, and also of those admitted for treatment early or relatively late in the progress of the disease. It was thought better not to attempt a deliberate sorting of cases in respect of mildness or severity, but to trust that the distortion of chance scatter would become almost negligible in a fairly large number of cases. Reference to a possible influence of the "severity factor" on the results is, however, made later in the report.

Statistics of Results

Subject to the criteria mentioned above, patients at London and Aberdeen were placed in the groups for serum treatment, or for control, alternately in the order of their admission to hospital without selection as to age or severity. At Edinburgh the same general rules and criteria were observed, and there was no selection of cases for serum treatment. But in some wards of the Royal Infirmary serum was not used throughout the whole period of the inquiry, and consequently the patients from these wards overload the number of controls. In the other wards the alternate case plan was maintained to the end. At Glasgow the alternate case plan was not used, but patients in one hospital were treated with serum and those in another hospital served as controls. Hence it is only at Aberdeen and London that the serum-treated cases equal the control cases in number.

The variability of the type-incidence from season to season and from place to place (Table I.) shows how epidemics of pneumonia may differ bacteriologically, but, on the basis of these and other published figures, it may be assumed that two-thirds of all cases of lobar pneumonia in Great Britain belong to types which are suitable for treatment by the sera now available.

That the fatality of lobar pneumonia is influenced by the type of infecting pneumococcus as well as by the age of the patient is confirmed by Table II. for the Types I. and II. cases from the present series.

TABLE I.—*Type Incidence in Lobar Pneumonia for Cases of the Special Series*

Aberdeen

	1931–32.	*1932–33.*	Totals.
	%	%	%
Type I...	26 (29·2)	44 (44·4)	70 (37)
,, II...	20 (22·5)	16 (16·2)	36 (19)
,, III...	17 (19·1)	6 (6·1)	23 (12)
Other types	26 (29·2)	33 (33·3)	59 (32)
	89	99	188

Edinburgh *

Type I...	54 (28·0)	15 (20·0)	69 (26)
,, II...	88 (45·5)	51 (68·0)	139 (52)
,, III...	9 (4·7)	2 (2·7)	11 (4)
Other types	42 (21·8)	7 (9·3)	49 (18)
	193	75	268

London

Type I...	54 (33·7)	88 (56·0)	142 (45)
,, II...	48 (30·0)	26 (16·6)	74 (23)
,, III...	3 (1·9)	0 (—)	3 (1)
Other types	55 (34·4)	43 (27·4)	98 (31)
	160	157	317

Glasgow: Totals for 1930–33

		%
Type I.	.. ..	206 (34)
,, II.	.. ..	228 (38)
,, III.	.. ..	22 (4)
Other types	.. ..	146 (24)
		602

* In this Table the data from Edinburgh, though not from the other centres, include patients dying within 24 hours of admission to hospital; hence there are two more Type I. and eight more Type II. cases in this Table than in Table III.

TABLE II.—*Fatality in Different Age-groups for Cases Treated Without Serum*

Totals for Aberdeen, Edinburgh, Glasgow, and London

T. = Total; L. = Lived; D. = Died.

Ages:	20–60			20–30			30–40			40–50			50–60		
Type.	T.	L.	D.	T.	L.	D.	T.	L.	D.	T.	L.	D.	T.	L.	D.
I. ..	301	256	45	119	111	8	105	88	17	52	37	15	25	20	5
	15·0% died.			6·7% died.			16·2% died.			28·8% died.			20·0% died.		
II. ..	305	223	82	116	94	22	78	56	22	74	47	27	37	26	11
	26·9% died.			18·9% died.			28·2% died.			36·5% died.			29·7% died.		

Effects of Serum Treatment

The effects of serum treatment may be judged by considering changes (*a*) in the fatality-rate (Table III.), and (*b*) in the duration of illness among survivors in the series.

From the combined figures from the four centres it would appear that serum treatment is capable of reducing the fatality from Types I. and II. pneumonia, but that the improvement is limited to patients under the age of forty. It is unfortunate, from the point of view of statistical analysis, that the number of patients over the age of forty who were available for treatment was so much smaller than the number of younger patients. Nevertheless on this evidence it would seem that the life-saving effects of serum treatment are mainly, if not wholly, restricted to the ages at which natural resistance to the disease is ordinarily high. Looked at broadly the results do show a favourable influence on the fatality-rate in the younger patients with Type I. and also with Type II. antisera. But a closer inspection of the separate results from each centre reveals anomalies that demand further analysis.

Aberdeen showed a fatality-rate in Type I. pneumonia which was reduced with serum from the expected figure of 6 to only 1 in 35 cases. London, on the other hand, found the fatality-rate in Type I. slightly increased with serum, whereas that in Type II. was reduced to 4 from the expected figure of 10 deaths. The aggregate London figures are the more surprising, because Dr. Armstrong himself had in his first winter's experience been vividly impressed by the benefit obtained with serum in Type I. cases, and it was contrary to all his expectations when the figures of the second year swung the balance away in the opposite direction. In commenting on the change he observed that 18 of his treated Type I. cases were clinically classified as "severe" compared with only

TABLE III.—*Effects of Serum Treatment on Fatality*

TYPE I.—TOTALS FOR THE FOUR CENTRES

Age-group.	Controls.		Serum.		
	Cases.	Deaths and fatality %.	Cases.	Deaths and fatality %.	Expected deaths.*
20–40 ..	224	25 (11·2)	140	8 (5·7)	16
40–60 ..	77	20 (26·0)	44	10 (22·7)	11
				18	27

TYPE I.—INDIVIDUAL CENTRES

Age-group.	Controls.		Serum.			
	Cases.	Deaths.	Cases.	Deaths.	Expected deaths based on—	
					Local controls.	Controls for all centres.
Aberdeen :						
20–40..	22	3	25	1	3	3
40–60..	13	6	10	0	5	3
				1	8	6
London :						
20–40..	47	2	58	5	2	6
40–60..	23	6	14	6	4	4
				11	6	10
Edinburgh :						
20–40..	34	5	19	1	3	2
40–60..	9	2	5	1	1	1
				2	4	3
Glasgow :						
20–40..	121	15	38	1	5	4
40–60..	32	6	15	3	3	3
				4	8	7

TYPE II.—TOTALS FOR THE FOUR CENTRES

Age-group.	Controls.		Serum.		
	Cases.	Deaths and fatality %.	Cases.	Deaths and fatality %.	Expected deaths.*
20–40 ..	194	44 (22·7)	111	14 (12·6)	25
40–60 ..	111	38 (34·2)	53	19 (35·8)	18
				33	43

TYPE II.—INDIVIDUAL CENTRES

Age-group.	Controls.		Serum.			
	Cases.	Deaths.	Cases.	Deaths.	Expected deaths based on—	
					Local controls.	Controls for all centres.
Aberdeen :						
20–40..	13	3	15	2	3	4
40–60..	4	2	4	1	2	1
				3	5	5
London :						
20–40..	22	6	25	3	7	6
40–60..	15	1	12	1	1	4
				4	8	10
Edinburgh :						
20–40..	45	11	38	8	9	9
40–60..	32	11	16	5	5	5
				13	14	14
Glasgow :						
20–40..	114	24	33	1	7	7
40–60..	60	24	21	12	8	7
				13	15	14

* The "expected deaths" are those which would have been recorded if the serum-treated groups had died at the same percentage rates as the corresponding controls.

7 "severe" cases among his controls. This raised the question of the chance scatter of patients with poorer prognosis from any cause into either the serum or the control group preponderantly. But the case records at the other centres were carefully revised from this point of view, and there was no evidence of the control groups having been unduly weighted by the chance occurrence of severe cases among them.

Apart from clinical judgment, the severity of an individual case may be estimated by the results of blood culture and by measuring the leucocytosis. The latter method was used in routine examination at Aberdeen and Glasgow, though not at the other two centres. An initial leucocytosis below 15,000 per c.mm. carries a relatively unfavourable prognosis. Examination of the records from Aberdeen shows that on the whole the initial leucocyte counts were higher in the cases which happened to be treated with serum than in the controls, but there was no great inequality in this respect. Nor was the explanation to be found in an unequal incidence of early bacteræmia. Table V. indicates that there were as many cases of early bacteræmia in the serum as in the control groups. The variation in the results at the different centres cannot be explained, but they show the difficulties in the way of accurately evaluating a treatment of this nature on the basis of small numbers of cases.

BACTERÆMIA

At Aberdeen blood cultures were systematically taken throughout the inquiry; they were made on every patient and early after admission, but only once. Positive blood cultures were obtained in 19 out of 66 consecutive cases (28·8 per cent.) by the method finally adopted of withdrawing blood by a syringe and injecting it directly into glucose broth. The earlier technique of using citrated blood in "venule" tubes for transference to broth gave a lower proportion of positive results. At Glasgow blood cultures were taken from all but 12 of the serum cases, and from 138 consecutive controls between the ages of 20 and 60; the cultures were made as soon as possible after admission, and the method of directly injecting the blood into glucose

TABLE IV.—*Incidence of Bacteræmia in Types I. and II. Cases (serum and controls) at Aberdeen and Glasgow*

Type.	Serum.					Controls.				
	Cases examined.	Positive.	Deaths.	Negative.	Deaths.	Cases examined.	Positive.	Deaths.	Negative.	Deaths.
I. ..	84	28	5	56	0	95	23	4	72	11
			17·9%*					17·4%*		
II. ..	65	18	7	47	7	95	22	11	73	8
			38·9%*					50%*		

* Of +ve cases.

broth was adopted throughout. Table IV. gives the total figures submitted from these two centres without distinction between the early and later methods of culture used at Aberdeen.

It would appear from the above results that serum treatment has little influence on the total fatality-rates of cases with bacteræmia.

EFFECT OF SERUM TREATMENT ON DURATION OF ILLNESS IN THE SURVIVING CASES

Here, if anywhere, it should be possible to show clearly the favourable action of antiserum. In a

series of 100 cases there may be 20 so heavily infected that they would normally die, and only a few of these 20 are in a state where reprieve from death is possible by the use of serum. The 80 potential survivors must all be patients with less severe infection; they are mostly well inside the zone at the edge of which serum could just show its efficiency by saving a few cases from death. It is helpful to visualise this by a rectangular diagram in which a black area shows the 20 per cent. of massive and fatal infection, while the remaining 80 per cent. of progressively lighter tint includes all those in whom the infection was below the intensity needed to kill. Antiserum may push the black band a little further back, to 15 per cent. or less, and then it meets a final barrier. But through all the great area of survival cases it should also be effective in lightening the grey tint of illness.

There has been too little attention given to the action of serum on surviving cases. This is partly because it is less easy to make an exact analysis of such clinical improvement than to record the simple fact of death or survival; and partly because physicians are chiefly concerned with the hope of saving the life of a patient with pneumonia, knowing that if only this can be achieved convalescence is usually rapid, whether the pneumonia had been severe or mild. But the survivors offer for study a field where the effect of the serum should be more easily demonstrable, since they are presumably in that state of relatively light infection where the serum can act to full advantage.

At all four centres the experience was alike—namely, that the serum treatment of Type I. and also of Type II. cases lessened the duration of the fever and diminished the number of cases in which fever ended irregularly by lysis.

Aberdeen reported—

Type I. pneumonia; average time of crisis—
In serum-treated cases .. 33·8 } hours after admission to hospital.
In control cases .. .. 101 }

Type II. pneumonia; average time of crisis—
In serum-treated cases .. 36·6 } hours after admission to hospital.
In control cases .. .. 104 }

Edinburgh and Glasgow used a different measure for the recovery, but the improvement was equally evident. The percentages of cases in which the fever ended on or before the fifth day of the disease, disregarding time of admission to hospital, were:—

	Per cent.
***Edinburgh*—**	
Type I. pneumonia—serum treated	36·4
control	8·3
Type II. pneumonia—serum treated	34·2
control	10·9
***Glasgow*—**	
Type I. pneumonia—serum treated	72·1
control	9·9
Type II. pneumonia—serum treated	34·1
control	5·3

Dr. Armstrong in London found that the time of crisis occurred on the average two and a half days earlier in the illness in his serum-treated Type I. cases, and two days earlier in his serum-treated Type II. cases than in the controls. The Glasgow workers also found that the average times of crisis in the serum-treated Types I. and II. cases were respectively two and a half and two days earlier than in the corresponding controls. Dr. Armstrong's table may be quoted in full, because it illustrates this clinical improvement in the survivors despite a failure to influence the death-rate in Type I. cases (Table V.).

TABLE V.—*Effect of Serum Treatment on the Course of the Illness in Survivors (London)*

—	Type I.				Type II.			
	Treated.		Control.		Treated.		Control.	
	Cases.	Av. day.	Cases.	Av. day.	Cases.	Av. day.	Cases.	Av. day.
Crisis ..	47	4½	35	7½	26	4½	19	6½
Lysis ..	12	7	26	9½	7	7½	11	9½
Continued fever ..	2	—	1	—	0	—	0	—

Data with regard to the convalescence were generally unreliable, because most of the patients were granted a routine time for recovery, and often a holiday before they were advised to resume full work.

In view of its effect on the course of the illness in Types I. and II. pneumonia, it might be expected that serum treatment would lessen the incidence of complications in patients who recovered from the initial infection. The total numbers of individual complications in both the serum-treated and the control groups at the four centres were, however, too small to enable fair comparisons to be made, except in the case of the important local complication, empyema. There was a suggestion from the total figures that the liability to this complication was reduced by serum treatment in both Type I. and Type II. pneumonia. The figures submitted from the four centres showed that empyema occurred in 4 serum-treated Type I. cases, against an "expected" figure of 9, and in 1 serum-treated Type II. case, against an "expected" figure of 3; in each case the expected figure was calculated from the incidence of empyema in the corresponding control group. The percentage incidence of this complication in the serum-treated and control groups for Types I. and II. pneumonia was as follows:—

Type I.—serum treated .. 2·4 (166 cases)
control .. .. 5·5 (256 ,,)
Type II.—serum treated .. 0·8 (131 ,,)
control .. .. 2·7 (223 ,,)

The evidence of the inquiry at the four centres is therefore in favour of the serum treatment, although with certain limitations. The inconveniences to the patient are little more than those of repeated intravenous injections. Fatality was reduced in the younger patients in this series by roughly half of the expected deaths. Thus in 140 serum-treated cases, aged 20 to 40, of Type I. pneumonia there were 8 deaths instead of the expected 16; and in 111 serum-treated cases of Type II. there were 14 deaths instead of the expected 25. Also, the duration of illness among survivors tended to be shortened by from two to three days, curtailing just that period near the end of a pneumonia where anxiety grows as the fever persists; and was a suggestion that the incidence of empyema was lessened by giving serum. These benefits were obtained both with Type I. and Type II. cases of lobar pneumonia. On the other hand, the data obtained in this investigation suggest that serum treatment has little or no power to decrease the fatality from Type I. or II. lobar pneumonia in patients over 40, or in the severely ill cases with bacteræmia.

On clinical impressions the workers were all agreed

that the appropriate antiserum frequently produces striking symptomatic benefit in cases of Types I. and II. lobar pneumonia, and that the best results are obtained with very early treatment. There was a consensus of opinion at the four centres that it is probably useless to give serum later than the fifth day of the disease.

Summary

1. Concentrated antiserum for Type I. pneumococcus reduced the fatality in Type I. cases of lobar pneumonia in adults between the ages of 20 and 40; from the total figures of the present inquiry, however, the treatment appeared to have little, if any, effect on the fatality in older patients (aged 40–60). The treatment seemed definitely to reduce the average duration of fever and illness in patients who recovered, and there was a suggestion that it also decreased the liability to empyema among survivors.

2. Similar effects were seen when Type II. antiserum was used for cases of Type II. lobar pneumonia.

3. Immediate serum reactions of a dangerous nature were rarely seen in the present series of cases, except that one or two batches of a particular concentrated mixed serum did cause rigors and collapse at both the centres where they were used. There were no unpleasant late anaphylactic results with the concentrated serum. On the whole, a good serum seemed to be devoid of disturbing effects on the patient, and on these grounds there need be no hesitation in the use of the treatment.

4. The benefits from serum are not so emphatic as to make it desirable that *all* severe cases of lobar pneumonia, irrespective of the type of the infecting pneumococcus, should be treated with Type I. and Type II. antiserum on the chance that they might belong to a type which is favourably influenced. Moreover, the special technique required for repeated intravenous injections, and the cost of the serum make the treatment unsuitable for universal application.

Each case must be typed as soon as possible, so that the appropriate serum may be used in the optimum dose; the use of the serum is not recommended except under conditions where typing of the pneumococcus can be obtained.

5. If accurate typing of the sputum can be done in five or six hours, serum should be withheld until the type is known, and then a dose of 20,000 Felton units of the specific serum given. But if more time is required for the typing, then a preliminary dose of 20,000 Felton units Type I., together with 20,000 units Type II. should be given; and the specific type serum, either I. or II. alone, continued when the nature of the infection is known.

Treatment is continued by injection of 20,000 units at a time, twice a day with approximately an eight-hour interval. Usually a total dosage of 80,000 units, with variation from 50,000 to 120,000 units, of the single specific serum is required, Type II. cases on the whole needing a larger dosage than Type I. If no obvious clinical improvement occurs in the first 48 hours of serum treatment, it is probably useless to continue with it.

6. The serum should be given intravenously. There is no satisfactory preliminary test for any peculiar sensitiveness of the patient to horse serum. The first injection should therefore be made cautiously and slowly, 1·0 c.cm. being introduced into the vein in a minute or two, and the total being injected in 10 or 15 minutes. Adrenaline solution 1/1000 must be ready beforehand, and 0·5 or 1·0 c.cm. of this should at once be injected *subcutaneously*, if the patient reacts unfavourably with collapse and failure of the pulse or urgent dyspnœa. Second and subsequent injections of serum may be given with less precaution.

In addition to anaphylactic sensitiveness of the individual, there is the chance that the serum supplied by the manufacturer may contain protein substances which are toxic to most individuals, as occurred in a few batches used in the present inquiry. To safeguard against this, 1·0 c.cm. of the serum may be injected intravenously, and the remainder of the dose slowly injected half an hour later, provided that no untoward symptoms have occurred. This precaution is unnecessary if the batch of serum is known to be harmless, either from other experience, or because the manufacturers state that it has already been tested from this point of view.

7. No data were collected in this inquiry with regard to the use of the serum in children, or in patients over the age of 60, or in cases of broncho-pneumonia.

MEDICAL SOCIETIES

WEST LONDON MEDICO-CHIRURGICAL SOCIETY

AT a dinner meeting of this society held on Feb. 2nd the chair was taken by Mr. TYRRELL GRAY, the president, and Mr. H. SCOTT, governor of H.M. Borstal Institution, Portland, opened a discussion on

Practical Psychotherapy

The lad sentenced to a Borstal institution, he said, first came up against psychotherapy in the clearing station: the boys' prison at Wormwood Scrubs, where he spent two months. The governor and doctors there were of extraordinary value to the Borstal institutions; they forecast the future of the lads with remarkable accuracy. They also had a say in his immediate destination. Each Borstal institution took a different type of lad; the Portland was the "tough" institution, specialising in boys who had failed elsewhere. The Feltham type of lad was younger and physically and mentally weaker. On arrival at Feltham he came under the personal supervision of a medical psychologist. The Prison Commissioners had decided that psychology had come to stay in reform work; a medical psychologist was to be appointed to Portland in April and in five years' time every institution would have its trained doctor. The Borstal institution was divided into houses, mainly for psychological reasons; there were six houses at Portland of about 70 lads each. Many of the housemasters studied psychology. The National Institute of Industrial Psychology had examined 400 boys at Wormwood Scrubs and vocational recommendations had been recorded, but only forwarded to the governors in half the cases, so that the other half formed a control group. Apart from help of this kind, housemasters—a most diverse crowd—had to use their common sense in fitting round pegs to round holes. The result of the experiment showed that 67 per cent. of success was obtained by the N.I.I.P. method and 43 per cent. by the older method. This was another straw showing the way the wind was blowing. Each lad presented a different problem. It was extremely difficult to estimate "successes." Each housemaster kept a record of lads discharged from his house. Many crashed on the rebound soon after discharge but made good after a period in

Wormwood Scrubs. Of 242 discharged during 1933 there had so far been only 49 failures.

BEHAVIOUR PROBLEMS IN CHILDREN

Dr. W. G. WYLLIE admitted that in some cases children might grow out of behaviour problems, but many of them, if untreated, became adult misfits, and it was not possible to tell which would find their own way out. A child under seven was an unreasoning animal and could not coöperate; the trouble was, however, usually in the environment and most often the parents had to be tackled. There were two groups of abnormal behaviour: unassociated or associated with physical abnormality. The first class included screaming, destructiveness, stealing, lying, and "unmanageableness"; the second included fæcal incontinence, bed-wetting, tics, stammering, and speech defects. Dr. Wyllie gave a number of examples. Two cases of fæcal incontinence had both been in brilliant children whose families were nagging them to work harder. It seemed to have been some chance that determined this particular form of escape from tension. The manifestation had been reserved exclusively for the home circle. Both children had responded quickly to simple explanation. It was cowardice to treat the problem child away from home, as it was expensive and he had to return home some time. Nevertheless treatment had sometimes to begin away from home. The chief fault in the parent was over-anxiety and over-attention rather than neglect. Illegitimacy and broken homes played a part sometimes. Stepmothers were generally over-attentive nowadays. The problem child had a constant feeling of unrest and insecurity, and an unhappy child immediately expressed itself overtly in some way. Punishment was a complete failure. A child who was a perfect pest at home was often quite all right at school. A physical examination, a rough mental test—or a complete examination by a trained psychologist in severe cases—and treatment by persuasion and suggestion were the three cardinal factors in these cases. Treatment was apt to take a good deal of time and tact. Results were, however, encouraging. Mental disorders of this kind must be quite as painful as acute tonsillitis.

THE ADULT'S PROBLEM

Dr. T. A. ROSS dealt, he said, with people who were ill and whose symptoms did not depend on physical disorder. There usually was physical alteration present, but it was not primary. Mind was to brain rather as music was to an orchestra; the orchestra was not music, nor was any part of it. Anxiety and fear had physical concomitants in every region of the body. In ordinary practice far more symptoms were caused by anxiety, and not by physical changes, than most doctors believed. Any medical text-book devoted 99 per cent. of its substance to the changes produced by disease, but the practitioner could find nothing wrong with the majority of his patients, and, knowing no psychology, began to invent diseases. Quacks flourished not so much because of the ignorance of the general public of science as because of the ignorance of doctors of psychology. The quack promised cure, and very few doctors remembered—or cared—to do that. Most of the sufferers from "heart trouble" or "indigestion" were suffering from anxiety and had never had a chance of discussing their troubles. It was the doctor's duty to find out what was troubling them. Everybody, with sufficient strain, was liable to neurosis. Organic disease should first be excluded. The patient must not be told any untruths. The physical examination should be complete and should be done once and for all. The doctor must not begin to doubt his diagnosis. Doctors had far too little confidence in themselves and in their first opinions. All necessary investigations should be carried out, but not pseudo-scientific ones of which no one really knew the significance. The patient should then be told that his illness depended on anxiety. The only way to get at his anxiety was to sit down and take the history of his life. Every fresh diet did a dyspeptic good, especially if it contradicted the diet ordered by the previous doctor, because it gave hope. An enormous number of insomniacs would improve at once if they could be persuaded that insomnia per se did no harm at all—as all the experimental work showed. The patient was not to be told there was nothing wrong with him; there was something definitely wrong. To get rid of a symptom, however, was not enough; it would soon be replaced by another. The anxiety must be traced. Anxieties might arise from disappointment and boredom, and many of these patients could be improved by discussion, showing that their lot was not so bad. Another group arose from guilt, usually about something which did not really much matter. These could be assured that their practices medically did no harm, but the moral issue had also to be faced with them.

DISCUSSION

Dr. A. C. WILSON said that the most essential thing for a boy was a good understanding with his mother. When the parents did not get on together a very anxious situation arose for the child. The whole question of guilt was raised for him; in his efforts to bring them together he developed hate for the father which he projected on to the outer world. He would be unable to contend with bullying parent figures encountered in after life and had much explosive material pent up.

Mr. E. S. BYNG, M.I.E.E., of the National Institute of Industrial Psychology, spoke of the benefit of transferring employees to another part of the factory, and of the value of initial vocational tests. The misfits in industry were often tragedies. If boys leaving school could be advised what work they were fitted for, these tragedies could be averted. Borstal housemasters were in future to take a short training at the Institute.

The PRESIDENT said that the light-heartedness of marriage played a part in providing the bad homes from which children suffered. Heredity must play a part also.

Dr. H. H. MILLS emphasised the importance of training the infant by regular sleep and feeding, and later by organised games.

Dr. W. D. MCMURTRY asked whether it was better to tell a child fairy stories than history stories.

Dr. HOWARD STRATFORD asked what the relationship was between fear, anxiety, and worry. Fear was the background of the primary instincts and a very important thing. Real physical changes followed constant anxiety in time. The essence of treatment was to give confidence.

Dr. H. ISAAC described a case he had taken to Dr. Wyllie some years before. The boy's mother had refused to allow separation from her and he had got worse and worse until he had been run over and taken to hospital with concussion. He had then become an excellent child. Too little notice was taken of childish fears such as of darkness and of constriction from tight bedclothes. The religious nurse who told the child horrible stories of hell blighted many lives.

Mr. HAMBLEN THOMAS asked if there were many psychopaths in Russia where the family had been stamped out.

Dr. W. M. HEWETSON regarded the present as a most intellectually satisfying time; much of medicine was about to be recast. Town life was an enormous environmental change for the species.

Dr. A. CAWADIAS said that all organic disturbances could not be manifested by physical signs. There were chemical changes in the body which were just as organic as a vegetation on a valve. Mind could not be considered a cause of symptoms. There were no mental diseases, only mental reactions to disease. Well-conducted examinations did the patient no harm, and were better than treating perforated duodenal ulcers by psychotherapy. Migraine, asthma, and Graves's disease had formerly been classed as neuroses. The greatest psychotherapists were the good organic physicians.

ROYAL SOCIETY OF MEDICINE

SECTION OF ANÆSTHETICS

AT the meeting of this section held on Feb. 2nd, the president, Dr. H. P. FAIRLIE, occupying the chair, a discussion was held on

Modern Views on Respiration

Prof. SAMSON WRIGHT opened the discussion by dealing with the physiology of

NORMAL BREATHING

He said that the respiratory centre probably extended throughout the pons and upper part of the medulla oblongata. Trans-section of the midbrain in animals produced no effect on breathing, but should the upper part of the pons be damaged, there occurred a marked alteration in the respiratory rhythm—i.e., inspiration became very deep, and might be prolonged for two minutes or longer. So violently were the inspiratory muscles contracted that it was difficult to expel the air manually from the chest. Then the inspiratory muscles relaxed and expiration took place, and the cycle was repeated. When section was made through the upper portion of the medulla the type of breathing just mentioned was replaced by a regular series of gasps. Trans-section at the level of the apex of the calamus scriptorius permanently abolished all rhythmic respiration. The respiratory centre was connected with, and controlled the activity of, the lower motor neurones supplying the muscles of respiration, and the respiratory centre possessed an inherent rhythmicity, analogous to that of the sino-auricular node of the heart. The depth of breathing was mechanically regulated in a number of ways. During quiet inspiration the diaphragm was being stimulated through its motor nerve at low rates and developed a low tension. In deep breathing a larger number of fibres came into action, and they were stimulated more synchronously and rapidly to give a full tetanus, and the duration of the contraction might be prolonged. The purpose of breathing was to obtain supplies of oxygen and eliminate the CO_2 formed in the body. The oxygen requirements were in proportion to the degree of bodily activity; hence the first law of breathing was that the pulmonary ventilation was proportional to the metabolic rate.

For every calorie of heat liberated in the body, about 200 c.cm. of oxygen must be used. A consumption of 200 c.cm. of oxygen demanded a pulmonary ventilation of four litres. Any condition which altered the rate of metabolism, such as thyroid disease or exposure to cold, would modify the resting ventilation. The link between metabolism and pulmonary ventilation was probably provided by alterations in the CO_2 tension in the blood, to which the breathing was very sensitive. The pulmonary ventilation would vary with the reaction of the blood. Sometimes the breathing was adjusted to maintain the normal temperature of the body. Changes in the level of the arterial blood pressure modified breathing reflexly—i.e., a rise of pressure depressed breathing and a fall stimulated it. This factor probably came into operation in the resting person. Under certain conditions breathing was adapted to maintain the appropriate oxygen tension of the blood; breathing only responded to oxygen-lack when the latter was severe.

When the CO_2 percentage in the inspired air exceeded that found in alveolar air (5·6 per cent.), adequate compensation became impossible, and CO_2 was retained in the blood; then headache, diminished sensibility, weakness, and mental confusion came on, and at a later stage loss of consciousness. Finally, respiration became depressed and circulation might fail, largely because of poisoning of the heart. If the CO_2 tension of the blood was artificially lowered by over-ventilation, breathing was depressed, and might even stop. Other effects of over-ventilation in man included leucocytosis, hyperglycæmia, diuresis, increased excretion of phosphate, and the usual urinary changes to compensate for an alkalæmia. The mode of action of the CO_2 was very complex, but it acted, in the main, directly on the respiratory centre, and also partly reflexly by stimulating sensory nerve-endings in the carotid sinus region and the aortic arch, thus sending exciting impulses to the centre.

Common causes of acidæmia were starvation; diabetes, or unbalanced carbohydrate to fat ratios in the diet, leading to accumulation of acetone bodies; injection of ammonium chloride; methyl-alcohol poisoning; and certain types of nephritis due to retention of non-volatile acids. It was important to grasp the facts (1) that the inhalation of pure oxygen had no effect on respiration, and (2) cyanosis depended solely on the presence of excessive amounts of reduced hæmoglobin in the capillary blood, hence it was an index of oxygen need. A rise of blood pressure in the intact resting animal reflexly depressed respiration, while a fall of blood pressure reflexly stimulated breathing. The vagal afferents coming from the laryngeal mucous membrane were concerned with the cough reflex, and guarded the respiratory passages against the entrance of foreign bodies. The afferent fibres coming from the substance of the lung regulated the rhythm of breathing. Sinus arrhythmia had been shown to be due to an irradiation from the respiratory to the cardiac centre. During inspiration, the activity of the vagus centre was diminished and the heart quickened, while during expiration the discharge of the vagus centre was increased, and so the rate of the heart was slowed.

RESPIRATORY FAILURE

Dr. ALAN MONCRIEFF said the body had but little power of storing oxygen, and if the apparatus responsible for obtaining this essential element failed, there was always the possibility of a fatal result, while varying degrees of minor failure brought about corresponding disability. Among the new-born, the principal causes of respiratory failure were—in order of frequency—(1) obstruction in the respiratory tract, (2) delayed expansion of lungs, (3) narcosis, (4) circulatory failure, (5) intracranial damage, (6) failure or delay in function of the respiratory centre.

Obstruction and delayed expansion.—The first two of these were intimately related. Recent studies had shown that expansion of the lungs after birth was by no means as rapid as had been formerly thought. The alveoli in the normal infant took several days to reach their full expansion, and much force was needed to separate the moist and adherent surfaces; even a small degree of

obstruction could gravely interfere with this process, and he thought the need to clear away mucus and debris from the upper air-passages had not been sufficiently emphasised. A combined suction and air delivery unit seemed to be a desirable piece of equipment at every maternity hospital, and he hoped soon to experiment with an apparatus of the type recently described by Mr. W. M. Mollison.

Narcosis in the new-born was not uncommon after the mother had been given morphia. These babies were blue at birth, and breathed feebly, with long periods of apnœa. Shute and Davis (U.S.A.) recommended pure carbon dioxide, followed by pure oxygen administered by a mask. Dr. Moncrieff thought a lower concentration of CO_2 was desirable, and that a mask was unnecessary.

Cyanosis was not directly associated with the amount of carbon dioxide in the blood; it depended on the absolute amount of reduced hæmoglobin present. When this reached a certain threshold, cyanosis appeared. Artificial respiration might sometimes remove the cyanosis of infants, but by lowering the CO_2 tension in the alveoli and thus in the blood produced such a gross interference with the liberation of oxygen in the tissues that a serious, often fatal, degree of anoxæmia might develop. This condition of apnœa could be prevented by using carbon dioxide mixtures.

Of the mechanism of *respiratory failure of central origin* little was known. The nutrition of the centre was of great importance, and if the blood-supply was deficient, depression of the centre would occur. That was seen in certain cases of heart failure, in which, despite the absence of any gross change in the lungs, breathing was rapid and shallow. Increased intracranial pressure also might lead to anæmia of the medulla and thus to a depression of the respiratory centre. Cheyne-Stokes respiration occurred in this form of disorder, probably owing to associated changes in the vasomotor centres. Failure of respiration might follow poisoning of the centre, for example by certain endogenous toxins, as in uræmia, or by sedative drugs, such as morphia and members of the barbituric group.

Respiratory failure of peripheral origin might be due to faults in the ventilating power of the lungs. Muscular failure, as when the diaphragm or the intercostals became paralysed, had seemed hopeless to treat until the invention of the Drinker apparatus; cases of temporary paralysis could now be tided over. Decreased pulmonary ventilation occurred when the patient was not breathing at the optimum level in the matter of tidal air and rate of breathing. A patient breathing deeply might actually be ventilating the alveoli less efficiently than when breathing quietly. If the circulation of the blood was impaired through very serious lung disease there might be little or no interference with respiratory efficiency, since the circulation from the pulmonary arteries to the pulmonary veins might be completely shut off, the nutrition of the lung being kept going by the bronchial arteries from the systemic circulation. In these circumstances, as no venous blood was flowing through the damaged portion of lung, no unoxygenated blood was flowing back to the left auricle.

In the treatment of respiratory failure it was important first to ascertain its type. The central causes of failure represented the more serious problems; Dr. Moncrieff knew of no satisfactory stimulant of the respiratory centre. Atropine was supposed to counteract the effect of morphia, but he would rather use it before than after the centre had been paralysed. Drugs of the lobeline type seemed to have a stimulant effect somewhere in the nervous mechanism of respiration, but the after-effect of members of the nicotine series was depressing. The most efficient stimulant seemed to be carbon dioxide in oxygen, provided the circulation had not failed.

Attempts at forced ventilation of the lungs which washed out the CO_2 might fail in their purpose. Dr. Moncrieff thought that tracheal intubation (or the use of a mask) and rhythmic pumping of carbon dioxide and oxygen mixtures was preferable to artificial respiration where skilled aid and the necessary apparatus were available. Failing this, artificial respiration, properly carried out, was the most valuable method. It was unfortunate that so few students and practitioners had been taught the method. A strength of 5 per cent. of CO_2 he regarded as sufficient for the resuscitation of babies, and for general use 7 per cent. Pure oxygen was a valuable life-saver in certain forms of respiratory failure, especially when the pulmonary epithelium was diseased, and in all cases where anoxæmia was the primary and fundamental cause of the condition.

DISCUSSION

The PRESIDENT asked how long an interval elapsed before distress was experienced when a person was breathing CO_2; also what strength was needed to set up this distress. Following such a discovery as that of CO_2 as a respiratory stimulant was the tendency to use it for everything; he had seen CO_2 employed when it was quite unsuitable. When the Canadians spoke of "pure CO_2" they meant by an open mask, therefore a certain amount of air was mixed with it.

Dr. C. A. KEELE suggested that when the circulation of a particular patient was so defective that CO_2 could not pass into the respiratory centre, this also prevented the passage to the centre of any drugs which might be injected to mitigate the condition.

Dr. J. GHOSH asked whether, in cases where some of the respiratory muscles were paralysed, as in spinal anæsthesia for operation, the respiratory centre was still sending messages to the muscles, but they did not respond because they were paralysed. In the face of this, should one give more CO_2, or give oxygen?

Dr. P. M. G. RUSSELL thought Dr. Moncrieff deprecated the practice of compressing the chest of the new-born infant, but the action of the Drinker apparatus, of which he approved, seemed to be identical.

Dr. E. FLETCHER spoke of some cases in which lungs had been filled with lipiodol and complete respiratory failure had ensued, and yet the circulation had continued for several minutes.

Dr. NIEL MCDONALD drew attention to a recent report that a medium in a trance was breathing at the rate of 300 times a minute, and yet there were no changes in the blood.

Dr. W. HOWARD JONES referred to a statement that the amount of reduced hæmoglobin in the blood and the amount of oxygen in the blood could be considerably diminished in prolonged nitrous oxide gas administration without material damage to the patient.

Prof. SAMSON WRIGHT, in reply, said that, when a 20 litre bag was used, signs of distress were usually pronounced by the time the strength of the CO_2 reached 7 per cent., and five to ten minutes were taken to reach this tolerance point. If respiratory muscles were seriously paralysed, asphyxia would result, and the degree of trouble would depend on the amount of muscle available. In most of the operations during which observations were made a considerable fall in the CO_2 in the blood was noted. Prolonged oxygen-lack in the administration of nitrous oxide did not do much harm, as the oxygen need was small.

Dr. MONCRIEFF also briefly replied. He said that in certain cases where circulation was failing, the speed with which CO_2 reached the respiration centre was poor. He was hoping for some drug the injection

of which would rapidly stimulate the centre. The Drinker apparatus carried out a quiet process and caused normal ventilation. It was most effective in cases of muscle failure. In the lipiodol cases he considered that the failure was due to a sudden deprivation of oxygen.

SOCIETY OF MEDICAL OFFICERS OF HEALTH

AT a meeting of the fever group of this society held on Jan. 26th, with Dr. H. S. BANKS, the president, in the chair, a paper on

Varieties of C. Diphtheriæ

was read by Dr. WILLIAM MAIR. He began by describing his classification of diphtheria bacilli based on the separation of (1) the barred group which does not ferment starch and which is highly characteristic in its morphology, mode of growth, and reaction in the guinea-pig; and (2) the starch-fermenters, whose morphology is not so characteristic; from (3) the remaining strains which form a miscellaneous group. The subsequent discussion made it clear that Dr. Mair's barred form corresponds to the "intermediate" form, the starch-fermenters correspond to the "gravis" group, and the miscellaneous group includes the "mitis" and "atypical" groups of the Leeds workers. Figures based on several thousand cultures showed, he said, that in recent years there has been an increase in the barred and starch-fermenting strains in London, and that these strains are now associated with the more severe cases of diphtheria.

Dr. ALEXANDER JOE then gave the results of 192 cases which he had classified clinically at the North-Western Hospital and in which Dr. Mair had typed the organism. The 53 cases in which starch-fermenting organisms were found showed a paralysis-rate of 21 per cent. and a case-fatality of 11 per cent.; 84 cases in which barred forms were found showed a paralysis-rate of 24 and a case-fatality of 8; while the non-fermenting group of 55 showed a paralysis-rate of 9 and a case-fatality of 6. The cases were not consecutive and the series contained a higher proportion than normal of severe and moderately severe cases, but otherwise Dr. Joe thought them representative. Though cautious about the statistical interpretation of his results, he believed they gave some support to the views of the Leeds workers. He also referred to the interesting behaviour of diphtheria in London which at present, in the view of most of his colleagues, was tending to become more severe. If this tendency increased it would be of great importance to note whether starch-fermenting organisms became predominant.

Dr. J. S. ANDERSON (Leeds) said that the suggestion that the association of severe diphtheria with gravis strains was a local phenomenon was now obviously unfounded. He restated the view that endemic diphtheria might be caused by mitis strains and epidemic diphtheria by gravis and intermediate strains, and drew the attention of clinicians to the conspicuous decrease in the incidence of laryngeal disease in Leeds, and to the marked increase in the case-mortality between the ages of 5 and 10, both of which were features of a severe epidemic in which gravis strains were predominant.

Prof. J. W. MCLEOD (Leeds) said that, including the figures now brought forward by Dr. Mair and Dr. Joe, the bacteriological type and the clinical condition had been correlated in 2000 cases of diphtheria in fever hospitals in Dundee, Glasgow, Hull, Leeds, London, and Manchester. The results could be summarised as follows:—

Type.	Incidence %.	Case-mortality %.
Gravis ..	.. 45 ..	.. 13·6
Intermediate	.. 35 ..	.. 10·5
Mitis ..	.. 17 ..	.. 3·2
Atypical..	.. 2 ..	No death recorded.

These facts, together with the observation that infectivity of the pellicle-forming and starch-fermenting strains seemed to be greater, appeared to justify the adoption of the name "gravis" for these strains. Although the evidence from animal experiment was less frank, it was clear that here also the gravis strains were more formidable. Of the eight mitis deaths in this series observed outside London, all but one—that of an infant who first received treatment on the seventh day of disease—had been complicated by tracheal obstruction, broncho-pneumonia, or severe enteritis. Primary toxic deaths seemed to be extremely rare in mitis infection.

Dr. R. A. O'BRIEN pointed out that diphtheria, though virtually a preventable disease, still caused many deaths. The profession therefore owed much to the Leeds workers for stimulating valuable research on typing. So far as he knew, diphtheria antitoxin used prophylactically had never failed to stop an outbreak anywhere in the world. Obviously, therefore, all types of the diphtheria bacillus must be, immunologically, closely related, if not identical.

Surgeon-Captain S. F. DUDLEY said that in the Royal Naval Medical College it had been found that trypsin serum agar gave a cleaner cut differentiation of the three types of Klebs-Löffler colony than the Leeds workers' chocolate medium. The colony morphology could however be distinguished on many media, including plain ox-heart agar. Dr. Jean Orr-Ewing had shown that starch-fermenting gravis strains received from different places fell into several serological groups—an observation which to some extent harmonised the discordant reports on the cultural and pathogenic characters of gravis organisms. In a school when diphtheria had been endemic for years, artificial immunisation was successful in keeping the school free of the disease for four years, though carriers of virulent diphtheria bacilli remained plentiful. In October, 1932, a gravis type of organism, of the same serological group as that predominant in Leeds, appeared for the first time in this school, and simultaneously an epidemic of mild modified diphtheria broke out in this fully inoculated population and the carrier-rate was higher than had ever been noted before. This observation was consistent with the view that *this serological type* of gravis *C. diphtheriæ* was more infective and invasive than the average. In the speaker's opinion the school was only saved from a much more severe and widespread epidemic by the fact that it had been inoculated against diphtheria. The cases which occurred in these partly immune subjects were trivial and mostly unrecognisable as diphtheria without laboratory confirmation. It was quite uncertain, however, how far other serological groups of gravis *C. diphtheriæ* deserved the name on clinical and epidemiological grounds. The bacterial flora changed so frequently with time and place that it was doubtful if any classification, or correlation of bacterial type with clinical picture which might hold to-day would have any permanence.

Dr. H. J. PARISH agreed that most strains now being isolated in London fell into the Leeds groups, although a year or two ago atypical strains were

common. The organism was apparently in a constant state of flux, and although severe diphtheria was to-day in several areas associated mainly with gravis strains, there was always a possibility that some new variant or even the classical mitis strain might cause a high mortality in future. Ewing showed that the Leeds gravis agglutinated differently from the Hull gravis. It might therefore be doubted whether direct spread had taken place.

Dr. E. L. STURDEE said that apparently severe outbreaks of diphtheria had been caused by both gravis and intermediate types. If at some future date a severe outbreak were found to be due to a mitis strain the situation would become clear. At any rate there seemed to be no reason at present to advise a medical officer of health to alter in any way his procedure for dealing with diphtheria. It would be interesting if bacteriological investigation were made of some obviously mild outbreaks in order to see by what type of diphtheria organism they were caused. There might be danger, Dr. Sturdee thought, in calling an outbreak severe if the day of disease on which antitoxin was given was not known. Some years ago a small outbreak of diphtheria occurred, with a hospital fatality-rate of about 15 per cent. Among the patients was a group of 25 children from a residential institution who had been given a small intramuscular dose of 4000 units of antitoxin on the first day of illness. None of these children died, though they were apparently affected with the same strain of diphtheria bacillus as the remainder of the patients in the hospital. If, therefore, all the cases had come from this institution the outbreak might have been considered mild. To describe the severity of individual cases according to their clinical condition on admission to hospital might cause difficulty because medical superintendents in different hospitals did not always place cases in the same category. Perhaps it would be wiser, in order to obtain comparable records of severity, to take into consideration merely the hospital case-fatality and the day of disease on which the patients received antitoxin. If it were then found that a certain type of diphtheria bacillus was usually responsible for severe outbreaks, a medical officer of health, on being informed by the bacteriologist that this type had been isolated from a patient, would be prepared for the possibility of a relatively severe outbreak.

REVIEWS AND NOTICES OF BOOKS

Radiotherapy in the Diseases of Women

By MALCOLM DONALDSON, B.A. Cantab., F.R.C.S. Eng., Physician Accoucheur with charge of Out-patients, St. Bartholomew's Hospital; Consulting Gynæcologist, Royal Northern Hospital, Livingstone Hospital, Dartford, &c. London: Hodder and Stoughton Limited. 1933. Pp. 148. 7*s.* 6*d.*

IN this book Dr. Donaldson has made no attempt to fill the need for a standard work in English on radiotherapy in the diseases of women but has supplied what he calls in his introduction a description in simple language for the benefit of the busy practitioner and student. The first section deals with the elementary facts regarding radium and X rays, and is clearly and fluently written. It will give the student, approaching the subject for the first time, some idea of the properties of the radium and of the physical laws which govern radio-activity, while the second chapter is an excellent summary of the work which has been done on the biological action of radium. At a time when many controversies are raging on the varied effects of radiation on normal and malignant tissues, this clear exposition of the ascertained facts and of the questions still to be answered should be very helpful to those who have no time to study the problem at first hand. The last chapter of this section describes the methods of applying radium, and indicates some of the physical laws which provide the basis for the choice of such methods. This section would be improved by a closer discussion of the fields which can be irradiated by applicators placed in various positions, with special reference to the anatomy of the female pelvis.

The second section is on cancer, and the subject is introduced by a chapter on the cancer problem in general which gives very shortly some of the author's own views on the organisation of treatment and research. The anatomy and pathology of the disease in the uterine cervix are then discussed in chapters which although brief are quite adequate. Not all gynæcologists will agree with the dictum that "very few of the patients who present themselves to the radiologist are really untreatable by any radiological technique." In view of the difficulty of condensing a subject which has a whole literature of its own into the compass of a couple of chapters, the presentation of the case for radiological treatment is an achievement. The results of operation are not belittled, and no exaggerated claims are made for radiation; figures are shown in tables and the reader can judge for himself. Some details of actual methods of treatment are given, and explain the differences between the technique in use at the best known centres. It would have been interesting to be told a little more about Dr. Donaldson's own technique, and on what biological grounds the interval between the second and third treatments has been reduced to one week. The chapters on carcinoma of the body of the uterus and other malignant growths in the female genital tract are on sound lines and there will be general agreement with the measures recommended, with the exception of the suggested surface treatment for the inguinal glands in carcinoma of the vulva. With radium at a distance of 1 cm. from the surface the dosage received by glands below a layer of subcutaneous tissue could hardly be adequate.

The last section deals with non-malignant gynæcological conditions which can be treated by means of radiation and should be of great value to the practitioner to whom it explains the type of case likely to benefit, and the action of radium in various disorders of menstruation. The possibility of the birth of deformed children if pregnancy follows such treatment is discussed. While all will agree with Dr. Donaldson on the necessity for great care, the dangers should not be over-estimated in view of the fact that a large number of normal pregnancies following irradiation have been published, and that most of the recorded cases of deformity followed irradiation *during* and not before pregnancy.

The book has an attractive format and is well printed, and this combined with the easy and pleasant style in which it is written should ensure a welcome for it.

Vaccine Therapy

In Acute and Chronic Respiratory Infections. By H. T. GILLETT, M.D. Lond. London: H. K. Lewis and Co., Ltd. 1933. Pp. 103. 5*s.*

THIS small book is confined, as indicated in the title, to respiratory infections and, further, tuberculous

infections are excluded. During the last 30 years vaccine therapy has become an established method of treatment in a considerable degree, but in the hands of some has not achieved a sufficient measure of success to give it a place among the accepted methods at our disposal. It may be useful therefore to reconsider the factors which determine failure or success. Some of these are here discussed by Dr. Gillett in the first chapter of this book, which deals with dosage. He points out that a vaccine made from one strain of a given organism and by one method may prove quite impotent as an antigen, while one made from another strain and by another method may be a potent antigen. Bearing this in mind he states that a vaccine should be made up: (1) from virulent organisms; (2) from cultures grown on a medium that approaches the composition of the human tissues; (3) from primary young cultures of less than 24 hours' growth, even at the expense of using impure cultures; (4) from whole cultures. He prefers to sterilise the vaccine by heating it to 37° C. for 24 hours in 0·5 per cent. carbolic rather than expose it to higher temperatures. Assuming that efficient dosage depends on the antigenic potency and the patient's response—which can in practice only be judged by clinical observation—he deprecates sending out vaccines in a series of graduated doses which give insufficient scope to the practitioner who is to treat the case.

In Chapter II., on influenza, Dr. Gillett shows a leaning towards *B. influenz.* Pfeiffer as a causal organism and quotes figures showing a diminished incidence and mortality in groups of people inoculated with a mixed vaccine containing this organism. There are, however, statistics which do not point in this direction. In Chapter III., which deals with prophylactic inoculation against the common cold, the author also advocates combining vaccine therapy with surgical measures in the treatment of enlarged tonsils and adenoids. In Chapter IV. he claims considerable success in pneumonia for a suitable vaccine given in the pre-sensitisation period. Chapter V. relates illustrative cases which, being selected, will not convince the sceptic while to the believer they are superfluous.

The principal value of this book lies in the points, made in the first chapter, which may explain some of the failures of vaccine therapy when carried out on the grand scale and by the dose-in-ampoule method.

Traité de physiologie normal et pathologique

Tome I.: Physiologie Générale. Edited by G.-H. ROGER, Hon. Professor of Physiology in the Faculty of Medicine of Paris; and LÉON BINET, Professor of Physiology in the Faculty. Paris: Masson et Cie. 1933. Pp. 1140. Fr.165.

THIS book is an extraordinary mixture of excellence and mediocrity, authority and simplification, brevity and prolixity. Multiple authorship is the explanation, and the same feature makes a general review difficult. The subjects of the essays, contributed by 11 authors, are life and living matter, cellular physiology, tissue culture, physical chemistry of the cell, cellular heredity, chemical constituents of the cell, the action of physical agents, action of X rays and radium, action of toxins, ferments, snake venoms. The treatment, as is stated in the preface, is in general elementary but not too much so, and there is inevitably a good deal of duplication. This is not necessarily a bad thing, but it means that there is much less material in the book than there appears to be. Since the same subject may be dealt with by as many as three different authors, the omission of an index is unpardonable; in a book of this type a good index should be one of the outstanding features.

Although what constitutes "general physiology" is more or less an open question, the choice of material seems to have been a little arbitrary in two instances. The articles on snake venoms and cellular heredity are interesting but irrelevant; indeed, the latter might easily prove misleading to the student, for it is not an orthodox account of the stated subject, but a monograph on the production of different strains of lactic acid bacilli. The individual contributions are for the most part straightforward expositions, systematic, interesting, and useful. The introductory article by one of the editors is redundant, and might with advantage have been omitted. Apart from a few pages of doubtful philosophy, most of its topics are better treated elsewhere; it contains some mistakes, and throughout the reader will find it difficult to separate fact from theory. The author who definitely raises the book from the commonplace is A. Blanchetière, whose article on the constituents of the cell is consistently good and occupies nearly half the volume. It is, in fact, an extremely competent and up-to-date review of a great part of the field of biochemistry; the footnote references to original papers in this review amount to the amazing number of 2600. These in themselves are of real value, for they are international in their range, and include, so far as we can judge, all the classical communications. This contribution compensates for the more obvious defects of the book.

To sum up, the critical reader will glean much from this volume which is difficult to find elsewhere; one unfamiliar with the subject matter, on the other hand, should not venture into the labyrinth without an able guide at his elbow.

The Diseases of Infants and Children

By J. P. CROZER GRIFFITH, M.D., Ph.D., Emeritus Professor in the University of Pennsylvania; Consulting Physician to the Children's Hospital, Philadelphia; and A. GRAEME MITCHELL, M.D. B. K. Rachford Professor of Pediatrics, College of Medicine, University of Cincinnati; Medical Director and Chief of Staff of the Children's Hospital of Cincinnati. London: W. B. Saunders Co., Ltd. 1933. Pp. 1155. 50*s*.

THE authors and publishers of this excellent textbook have achieved the unusual feat of arranging the re-birth of the twin volumes which formed the second edition as a single "infant Hercules," coupling the precocity of the *New World* with the stamina of the *Old*. The intention has been to render the book suitable for students as well as for specialists, but apart from the convenience of the single volume format, it is doubtful if this object has been, or indeed could be, successfully achieved. As a book of reference the work remains of outstanding value to pædiatricians, and the bibliography and presentation of the literature is probably unsurpassed in any book in English on this subject, in spite of one or two rather curious lapses. But the consideration of obscure conditions and debatable views is unnecessarily detailed for the needs of students, and consequently one who used it as an introduction to pædiatrics might well fail to gain a satisfactory sense of proportion. A detailed description, for instance, of the Pirquet system of feeding of children (which, the authors point out, is far too complicated for general

use and indeed is probably based on a false premiss) may be of considerable interest to the pædiatrician, but outside Austria is only likely to provoke in the student a sense of despair. Again, whilst chlorosis is disposed of in nine lines, a page and a half is devoted to sickle-cell anæmia. The illustrations are almost without exception excellent, though it is perhaps unfortunate that those showing the resuscitation of the new-born represent two methods that have been largely discarded.

Introduction to Physical Chemistry

By ALEXANDER FINDLAY, Professor of Chemistry, University of Aberdeen. London: Longmans Green and Co., Ltd. 1933. Pp. 492. 7*s*. 6*d*.

"Introductions in Physical Chemistry" might be an even better title for Prof. Findlay's new and remarkable book. Within its short space the reader is introduced to almost every branch of physico-chemical endeavour, and although the meetings may be brief, they result always in understanding and never in boredom. The author from his experience has elected to develop the subject historically, almost biographically. He believes this to be the soundest method from the educational point of view. So that when he is informed, for instance, that Menschutkin was called Nicolai Alexandrovitch, the reader feels that this fact is given for good psychological reasons, though he may suspect that certain of the scientific worthies whose names and addresses are given so prominently would be as surprised as they are flattered at receiving such notice in a book of this size.

Whilst regarding the chapter on phase rule with particular respect, we were equally impressed with the excellent treatment of the theory of indicators. The volume is completely up to date (the neutron appears) and is a marvel of lucid compression; thus the Nernst heat theorem is made completely understandable in three pages. All this is to be had for the price of an ordinary novel.

Functional Affinities of Man, Monkeys, and Apes

By S. ZUCKERMAN. London: Kegan Paul, Trench, Trübner and Co. 1933. Pp. 203. 10*s*. 6*d*.

THE classification and relationships of the primates have for the most part been discussed exclusively in terms of structure. There has been a growing feeling in recent years that this purely anatomical method fails to make use of a great many facts which have been accumulated about function, and Dr. Zuckerman has here assembled the available physiological and biochemical data relevant to man and his nearest allies to see what light they may throw on kinship. Thus man, apes (gorilla, orang utan, chimpanzee), gibbons, all the monkeys, *Tarsius*, and some of the lemurs have no breeding season; man, apes, and monkeys all drink by suction, not lapping; man, apes, gibbons, and old-world monkeys have a menstrual cycle, while human blood-groups are found only in apes and gibbons, which are probably also the only animals which, like man, excrete uric acid instead of allantoin. There is no suggestion that any revolutionary reclassification is needed; considering the intimate connexion between structure and function that is hardly to be expected. But the tale is one of great interest and it should stimulate inquiry into the many gaps which need filling up: the necessary investigations would get on quicker if our zoological gardens were schools of anatomy and physiology rather than exhibitions. Hæmatologists would have liked more definite information about the polynuclear leucocyte with fine neutrophil granules which is commonly said to occur only in man and apes, and a rather fuller account of infectious diseases would have been useful. There is a good list of references.

Clinical Contraception

By GLADYS M. COX, M.B., B.S. London: William Heinemann Ltd. 1933. Pp. 173. 7*s*. 6*d*.

IN her capacity of medical officer to the Society for the Provision of Birth Control Clinics Dr. Cox has had, in the last ten years, an almost unrivalled experience of the medical aspects of the problem. This volume was written at the request of the National Birth Control Association to supply the need of a book which could be recommended to those local authorities who wished to take action under the Ministry of Health's Memorandum 153/M.C.W. and Circular 1208—documents setting forth the conditions under which advice on contraception may be given to married women on medical grounds at rate-aided welfare centres. Dr. Cox's book admirably fulfils this purpose. In its twelve chapters are set out in full detail not only the advantages and disadvantages of the various existing methods of birth control, together with the indications for their use, but also the researches now in progress, which, it is hoped, will yield the methods of the future. The volume is well documented, and is written in an agreeable style. A full list of voluntary birth control clinics and of proprietary articles is appended, as well as the names and addresses of reliable manufacturers. Though many books on contraception have been written for the lay public, or jointly for the lay public and the medical profession, none has hitherto been written in England specifically for doctors. A gap in the literature has therefore been filled, for since doctors are being consulted more and more about the details of the practice of birth control the time is ripe for a book dealing with those technical and administrative problems with which medical men and women are primarily concerned.

Medical Life Assurance

A Pocket Guide. Third edition. By J. J. CURSETJI, M.D. Bombay: At the Union Press. Pp. 274.

IN this book the author sets out his own experience of life assurance practice in India, for the last ten years as chief medical officer to the Oriental Life Assurance Company. As we pointed out in reviewing the second edition six years ago, the problems of life assurance in tropical countries are in some ways more difficult than those in more temperate and equable climates. Dr. Cursetji has endeavoured to make the path of the assessor smoother by a fresh and more searching examination of the 20,000 lives which have passed through the Bombay office. He has brought actuarial material up to date and revised the tables of expectation of Indian assured lives and for the first time has compiled a table of blood pressure of Indian lives—finding, rather to his surprise, that the pressure was not appreciably different from that of European experience. In this edition the author has added notes in order to recall the memory of examiners to facts in medicine which they may have forgotten, and he hopes also that the book may prove useful for senior medical students preparing for final examination. He has a real grasp of the special problems of insurance medicine and his work should prove useful for its purpose.

THE LANCET

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THYROIDECTOMY FOR HEART FAILURE

THAT patients with cardiac failure may derive great benefit from total extirpation of a normal thyroid gland is an astonishing fact established by American workers during last year. The favourable effects on certain thyrotoxic patients with congestive heart failure of a reduction in the basal metabolic rate by subtotal thyroidectomy first suggested to H. L. BLUMGART, S. A. LEVINE, and D. D. BERLIN that cardiac distress in persons with normal metabolism might also be relieved if the metabolic rate was significantly lowered. In June of last year [1] they published an account of the treatment by thyroidectomy of three patients whose symptoms of heart failure had not responded to any of the known therapeutic measures, and of one patient with angina. A subtotal thyroidectomy performed in two of the heart-failure cases led only to temporary improvement, so a total thyroidectomy was performed on the third, the parathyroid glands having been identified and preserved, by the method devised by Berlin.[2] This procedure was remarkably successful, the patient's basal metabolic rate six weeks after operation ranging from minus 25 to minus 30 per cent. His orthopnœa, œdema, enlarged liver, and precordial pain completely disappeared; he felt strong and active and this condition was apparently maintained. The thyroid, after careful examination, was pronounced normal in gross and minute structure. BLUMGART and his co-workers at the Beth Israel Hospital and the Harvard Medical School have since published early results in various types of cardiovascular disease and coincident pathological states without chemical or pathological evidence of thyroid toxicity,[3] and more recently LEVINE, E. C. CUTLER, and E. C. EPPINGER have reported [4] twelve interesting cases of which all but two had the gland completely removed, for the most part with excellent results. The ætiology of the heart disease—whether of hypertensive, rheumatic, or syphilitic origin, or associated with sclerosis of the coronary arteries—seems to be irrelevant, and patients with angina are said to experience more or less complete relief from pain following the operation, which seems to be borne remarkably well even by seriously ill patients. LEVINE, CUTLER, and EPPINGER state that in their series only one death was attributable to it, and here there had been a recent coronary occlusion. In a further publication H. F. FRIEDMAN and BLUMGART [5] insist strongly on the necessity for extirpating the whole of the thyroid at once, since attempts to remove residual fractions after a subtotal thyroidectomy have met with no success. They have tried the effect of X rays on the normal thyroid in the hope that such treatment might be an effective substitute for surgery or a useful adjunct where subtotal resection had been done, but in spite of heavy dosage of the rays no beneficial effect could be demonstrated, either in those who had been submitted to subtotal resection or in those who were considered unsuitable for, or refused, operation. One patient whose condition remained the same in spite of massive irradiation showed conspicuous improvement, coincident with the reduction in the basal metabolic rate, when the entire thyroid gland was removed.

The results so far published of thyroidectomy in the treatment of heart failure both of the congestive and anginal forms certainly justify further trial. Only patients who have failed to improve on the usual methods of treatment and in whom the prognosis is therefore regarded as hopeless, are considered suitable for operation, and any new method, however drastic, which gives promise of relief in such conditions is surely welcome. In toxic goitre thyroidectomy usually serves to lower a high basal metabolic rate to normal, and often the effect on severe cardiac symptoms is highly satisfactory. The removal of a normal thyroid for such symptoms, however, is obviously in a different category, for here the basal metabolism is lowered below normal, and the supervention of new and undesirable symptoms associated with this state might be anticipated. Case records show that while very low levels of metabolism are unusual, symptoms of myxœdema do in fact appear not infrequently; and in this connexion it may be recalled that myxœdema has itself been held to lead to heart failure, though rarely. However, a satisfactory compromise is apparently achieved in cardiac cases subjected to total thyroidectomy by giving thyroid extract, when indicated, in doses insufficient to raise the metabolism to a normal level.

In judging the results of the operative treatment certain possible fallacies must be borne in mind. For example, in one of the communications it is claimed that effort angina was abolished by the operation in a patient who, it seems probable, had recently had a coronary occlusion. It is, however, common knowledge that occasionally after this accident there may be freedom from effort angina, and it would not be justifiable to attribute to thyroidectomy what may occur spontaneously until more clinical evidence can be mustered. In some of the cases quoted, again, thyroidectomy has done no more than to give freedom from pain during the last few weeks of the patient's life, a result which might equally well have been achieved by simpler measures. Its value cannot properly be estimated until more time has elapsed, for the survival rates of the patients, the permanence of the relief, and the degree to which they can resume ordinary life are all factors to be considered. The explanation of the phenomenon is still to seek; at the moment it is more empirical than rational.

[1] Arch. Internal Med., 1933, li., 866.
[2] Amer. Jour. Surg., 1933, xxi., 173.
[3] Arch. Internal Med., 1933, lii., 165.
[4] New. Eng. Jour. Med., 1933, ccix., 667.
[5] Jour. Amer. Med. Assoc., 1934, ciii., 17.

The fact remains that at the Beth Israel Hospital alone, total surgical ablation of the thyroid gland has now been performed on more than 50 patients presenting symptoms of congestive failure or angina pectoris which have not yielded to other treatment, and that the operation is said to produce both persistent lowering of the basal metabolic rate and definite clinical improvement. The after-history of these patients will be awaited with eagerness.

HOUSING CONDITIONS AND RESPIRATORY DISEASE

ONE of the defects of our present system of record-keeping of disease is that, while local mortality statistics are easily obtained, records of morbidity, except for the notifiable diseases, are retained largely in the hands of friendly societies and insurance companies, in so far as they are available at all. The Scottish department of health has just begun to do something with this material (see p. 322). In America special surveys of sickness have been made from time to time in recent years either to ascertain the incidence of one particular disease, like influenza, over a wide area, or to determine the relative importance of different forms of disease in local populations. Few similar inquiries have been made among civilians in this country, perhaps the best example being the series of investigations into influenza in several towns in 1918–19 published by the Ministry of Health.[1] In Glasgow during the twelve months from September, 1928, to September, 1929, a survey has been made of the sickness of two groups of poorer working-class people by Dr. C. M. SMITH, of the health department, one group inhabiting a slum area, the other similar in character but housed in a rehousing scheme at the outskirts of the city, each consisting of approximately a thousand persons. Dr. SMITH'S report has now been published by the Medical Research Council[2] and forms a valuable addition to the literature of epidemiology. Fortunately, perhaps, an influenza epidemic occurred during the inquiry, so that it was possible to compare the behaviour of respiratory diseases at such a time with their incidence in what may be called "normal" periods. The report gives detailed statistics of the cases of sickness of all kinds during the period of investigation and tabulates them according to severity, as measured by confinement to bed. Acute respiratory disease is shown to account for two-thirds of the total number of cases and almost one-half the bed-days of sickness. Even in the non-epidemic period, a third of the total invalidity was from this cause. Tuberculosis, acute infections, and chronic respiratory disease came next in order of invalidity. The total number of hospital bed-days used by this community of some 2000 persons was 6854, representing about 3400 bed-days per annum per 1000 of the population, or approximately 10 beds constantly occupied.

The mortality from pneumonia in poor-class districts is known to be high. In the combined areas under review the expected death-rate from pneumonia and bronchitis, calculated from the death-rate for the whole city during the same period and adjusted to allow for differences in the age-grouping of the population, was 3·93 per thousand. The rate was actually 5·96. The case-mortality rate, based on the admittedly small numbers of 55 cases and 12 deaths, was 21·8 per cent., which compares with a local hospital fatality of 22·9 per cent. From these figures Dr. SMITH concludes that the excessive death-rate in poor quarters was mainly due to the high rate of incidence (27·3 per thousand) rather than to greater fatality. It may, of course, be questioned whether the case-mortality among any complete group of cases is comparable with that in hospitals. In ten cities of the United States, however, during the 1928–29 epidemic of influenza, the fatality of pneumonia ascertained by special inquiry[3] was found to be 20·2 per cent. In that inquiry, carried out on somewhat similar lines to that in Glasgow, the rate of incidence was only 4·9 per thousand, and although there may have been some deficiency of ascertainment, the lower incidence was probably due to the better class of family under investigation. Dr. SMITH'S inference seems, therefore, to be justified. The age-incidence of respiratory disease in Glasgow was in fair accord with experience elsewhere at all periods except the epidemic of 1918–19. As usual children under five years were most, and adolescents and young adults, 15–24 years, least affected. The number of cases over 55 years of age was, however, unusually low, and this applied to all degrees of severity of respiratory involvement as measured by duration of confinement to bed.

Comparisons are made between the occurrence of these diseases in the slum-dwellers and the displaced population. It might have been expected that the latter would suffer least. In fact, the reverse was the case. This is not to be taken as meaning that rehousing has no beneficial effect on the transmission of infection (in passing it should be remarked that even the new schemes perpetuate the Scottish system of two-, and to a lesser extent, three-roomed dwellings), for there were, unfortunately, disturbing factors in the comparison. In the slum area there was rather less unemployment and, moreover, about one-fifth of the population were of foreign origin, mostly Jewish or Lithuanian, whose dietary habits appeared to be better than that of the native population. When the comparison is limited to the latter groups there is little significant difference between the case-rates of more severe respiratory disease in the slum and the new houses. Further, a considerable number of the families recently transferred to new houses were tending to crowd together unnecessarily in sleeping-rooms, thus failing to utilise the opportunities for better spacing during just those hours when mass infection is most liable to occur. There is, however, a degree of similarity in the findings to those of Dr. M'GONIGLE at Stockton-on-Tees which cannot be overlooked, especially in view of the worsened financial position of the rehoused population.

[1] Reports on Public Health and Medical Subjects, No. 4, 1920.
[2] Special Report Series No. 192. London: H.M. Stat. Office. 9d.
[3] U.S. Pub. Health Rep., Jan. 5th, 1934.

"AUTOPHARMACOLOGY"

Loss of faith in many of the older drugs has been more than compensated by an increasing knowledge of animal extracts, and the present tendency is to look upon the body itself as the most likely source of efficacious remedies. The best known of these, such as antitoxins and endocrine principles, may be regarded as having for the most part general as distinct from local effects, but more and more is now being learnt about other chemical substances, produced by living cells, which act in a restricted area. The investigation of these is relatively difficult, for it is easier to study a substance produced locally—in a gland, for example—and having a general action, than one produced generally by all tissues and acting locally. Yet Sir HENRY DALE in his Dohme lectures [1] at the Johns Hopkins University school of medicine was able to show that much valuable information has been gained about those which act on blood-vessels. On a note of caution, nevertheless, he said: "This view of the significance of histamine in the body . . . provided such a satisfactory explanation for the resemblances which had puzzled us, as to create a new temptation to undue haste in generalising its significance . . . it was as easy now to say 'histamine' as it used to be to say 'metabolites.'" It is to the credit of the principal workers in this field that they have steadfastly resisted such temptations. This attitude of mind has brought appropriate rewards, for concentration on experimental results which did not quite agree with those expected has led to fresh triumphs and the discovery of further important tissue constituents.

The supposed connexion between wound shock and histamine was never certain, DALE points out, and became less probable when it was shown that muscle contained a relatively small amount of this substance. Now that the toxic theory of wound shock is itself in doubt, there is little to be gained by trying to account for the symptoms chemically, and except in relation to burns, histamine has faded into the background from this point of view. On the other hand, its responsibility for most of the symptoms of anaphylactic shock and for the local reaction to cutaneous injury described by Sir THOMAS LEWIS is to all intents and purposes established. Laborious work showed first of all that the presence of histamine in tissue extracts was of significance, then that it was actually stored as such in the living cell, and finally that some tissues such as muscle had a low content, whilst others such as the skin and lungs had a high content of histamine or "something physiologically indistinguishable from it." This conception of histamine as resting preformed in cells is valuable, since it is easy to imagine its liberation if the cell is injured. In LEWIS's skin reactions the injury is mechanical; in anaphylactic shock it results in some way from the precipitation of antigen by antibody. In the one instance histamine is set free locally, in the other more generally. In both cases it accounts for most of the phenomena observed, but not quite all; other substances play a part.

[1] Bull. Johns Hopkins Hosp., 1933, liii., 297.

Surrounding the immediate area of a mild skin injury, whose redness and œdema are accounted for by histamine, LEWIS described an irregular flush, due presumably to arteriolar dilatation. This is now attributed to a local reflex originating at the point of injury and terminating in the surrounding arterioles. The special significance of this reflex is not so much that the central nervous system is not involved, as that there is little doubt that a chemical agent, acetylcholine, is liberated at the nerve-endings concerned and is directly responsible for the vasodilatation. That this substance mimics the action of parasympathetic nerves has long been known, and the first demonstration that something resembling it is actually produced during activity of these nerves came from Austria. It remained for those working in the National Institute of Medical Research at Hampstead to demonstrate the natural occurrence of acetylcholine in the body. The subsequent discovery that it was destroyed by an enzyme immediately it had acted at once accounted for the parasympathomimetic character of physostigmine, and provided a means for preventing the destruction of acetylcholine, since physostigmine was found to inhibit the activity of the enzyme. Preservation of acetylcholine by this alkaloid has allowed of its detection in the fluid from the iris after stimulation of the third cranial nerve, from the submaxillary gland after action of the chorda tympani, and even from the superior cervical ganglion during stimulation of the sympathetic. Evidence of a similar nature suggests that antidromic vasodilatation in voluntary muscle may also be due to liberation of this body. It is almost certain, therefore, that post-ganglionic parasympathetic and some other nerve-fibres act only in virtue of local liberation of acetylcholine, and probable that both parasympathetic and sympathetic preganglionic fibres are also "cholinergic" [2] in their transmission of impulses. OTTO LOEWI and W. B. CANNON have already shown that an adrenaline-like body is set free at true sympathetic ("adrenergic") nerve-endings, so that the chemical theory of autonomic nervous action is well established.

DALE further comments on the presence in large quantities of another vasodilator substance, adenosine, in tissues such as muscle whose activity is always accompanied by a tremendously increased blood flow through them. There is so far no direct evidence of the participation of adenosine or its compounds in any such reaction, nor yet in massive injury, but it is unlikely that its presence is without significance. One of its most interesting and suggestive properties is the power of causing a leucocytosis. Many other vasodilators have been detected in tissue extracts without having been isolated chemically; one of these, Kallikrein, appears to be set free from the blood when this is acidified, thus providing a further possibility for the mechanism of increased blood-supply to active tissues. The blood-vessels are, of course, not the only muscular organs upon which these numerous substances act, and it might be thought arbitrary

[2] Dale, H. H.: Jour. of Physiol., 1933, lxxx., 10 P.

to have related them all to a single effect. DALE remarks, however, that they all have a strictly localised action and a short life, and that the only reactive tissue with which they are likely to come in contact in this brief time is that of the smaller blood-vessels. Moreover, a wealth of local mechanisms for effecting vasodilatation is an important corollary to the well-established dual mechanism for producing an immediate and universal vasoconstriction. As yet there are no definite indications as to the best way of dealing with arterial hypertension, but if this and other work continues to yield such confident results we should know a great deal in the course of a few years about the chemical control of vascular tone and its therapeutic possibilities.

The term "autopharmacology" has been applied to this field of investigation for reasons obvious enough. Whether it is sufficient to distinguish it from the study of the more general effects of hormones, or even desirable to do so, is rather doubtful. In any case, it must include many collateral lines of research—for instance the part played by tissue constituents in the clotting of blood, the movements of phagocytic cells and spermatozoa in response to chemotaxis, and the local production of melanin as a defence against ultra-violet rays. Whatever name be given to such work, laborious, precise, and unremitting as it is, those engaged in its many branches merit encouragement for the future and congratulation upon the past.

ANNOTATIONS

ANTHRACITE DUST

OPINION has long been in conflict whether or not anthracite dust causes or predisposes to pulmonary disease. In 1931 the Mines Department and the Home Office, anxious to ascertain where the truth lay, requested the Medical Research Council to make inquiry, and a report has now been issued[1] by the Council's standing committee on industrial pulmonary disease, of which Prof. A. J. Hall is chairman and Dr. E. L. Middleton, one of H.M. inspectors of factories, secretary. The problem was found to be difficult of approach. Preliminary study of the size and constitution of the working population at the South Wales anthracite collieries showed this; it was not possible by systematic examination of the underground workers themselves, who form the bulk of the persons exposed, to devise a clean-cut experiment in which the results could be attributed to anthracite dust alone. Anthracite is not the only dust to which they are exposed, and if these men were in fact shown to be less healthy from the pulmonary point of view than other workers not exposed to anthracite dust, it could not be assumed that such higher rate of disability was due to their exposure to this dust. The committee then considered the possibility of carrying out an investigation of the surface workers at the Swansea collieries. These are exposed at the screens to considerable amounts of anthracite dust without exposure to the other dusts met with underground. Here, however, other difficulties presented themselves. Work at the surface of a colliery is lighter than underground. Surface workers include a proportion of men who for some reason or other are physically unequal to become underground workers, a number of boys who are not yet ready for full underground employment, and also men who have previously worked underground but owing to incapacity have been transferred to lighter work at the surface. As the total number of surface workers is not large, this inclusion of immature and partially incapacitated lives would seriously invalidate the data. The committee determined to make a beginning with a clinical and radiological survey of the group of men known as coal trimmers. These men are engaged in the hold of a ship during loading operations, their task being to level the coal as it is shot into the hold by the mechanical conveyors. Their work is heavy and requires physical strength and fitness. The exposure to coal-dust is considerable and at Swansea much of this dust is anthracite. It was determined to examine 40 as a sample of the 250 men thus employed. The clinical examinations were carried out by two members of the Silicosis Board, each making an independent examination and report. The radiograms were taken quite apart from the clinical examinations. The two sets of findings were then correlated by the committee and classified into four groups:—

(*a*) (19 cases). Nothing to suggest fibrosis in the lungs.

(*b*) (14 cases). Evidence of fibrosis in lungs not considered to be due to dust but to other causes, mainly antecedent disease.

(*c*) (2 cases). Some clinical evidence of fibrosis, not confirmed radiologically.

(*d*) (5 cases). Pathological conditions found in the chest other than pulmonary fibrosis and not due to dust.

The report concludes by stating that the committee was unable to find in this series of cases any evidence that the inhalation of anthracite or other coal-dust had caused fibrosis of the lungs. No doubt the committee will now approach the problem from some other direction.

[1] Brit. Med. Jour., Feb. 3rd, p. 198.

CLOSED DRAINAGE IN PURULENT PLEURISY

EXPERIENCE during the influenza epidemic of 1918 showed what grave risks attach to open methods of drainage of empyema unlimited by adhesions. The lesson learned at such cost has not been forgotten, and closed drainage is now the rule in the treatment of purulent pleurisies arising in the course of pneumonia. When, on the other hand, empyema follows pneumonia, and the thickening of pus indicates that localisation has occurred, open drainage associated with rib-resection is still customary, and on the whole proves satisfactory. The question arises whether the closed method so strikingly successful in the earlier stages of influenzal empyema might not be more widely used in the treatment of other forms. It is obvious that streptococcal empyemata provide the worst conditions for open pneumothorax. The mediastinum is liable to serious displacement, and this, while cramping the function of the opposite lung, may also embarrass the heart and intrathoracic circulation; toxæmia reduces the general resistance, and the vital capacity is lowered. But the advantages of the closed system of drainage are not limited to the avoidance of these dangers. Chronic empyema is still too often the sequel of acute empyema, and may

develop whenever a lung is collapsed for too long a period. It has been remarked that any fool can cure an acute empyema, but to induce the re-expansion of a collapsed lung may tax the resources of the most experienced. Sometimes the thickened pleura that prevents re-expansion may be removed by a decortication operation, but this will have no effect on the secondary pulmonary fibrosis which may have resulted. As Dr. Coquelet [1] rightly maintains, the chief cause of chronic empyema is prolonged pulmonary collapse, and a wide opening into the pleura may go far to discourage re-expansion of the lung. Coquelet would try to get over these difficulties by employing closed drainage in every case of empyema treated under conditions which allow continuous supervision and after-care. This proviso is necessary, for continuous drainage demands special experience on the part of the practitioner as well as skilled nursing. He maintains, however, that when these conditions are fulfilled the method of closed drainage with pleural lavage and breathing exercises in its later stages reduces mortality, prevents chronic empyema, permits the slow evacuation of pus without shock or mediastinal displacement, and shortens the period of illness. Hence he holds that closed drainage should be the rule, whether as a measure of emergency in syn-pneumonic, or as a means of cure in meta-pneumonic, empyema due to infective organisms. His technique and the methods he uses are fully described in a paper that will repay a careful study.

THE DOCTOR IN OTHER SPHERES

THE examination of the achievements of medical men in other directions than in the practice of medicine has long been a favourite pursuit of the Regius professor of medicine in the University of Glasgow, and he has now epitomised the labour of many years.[2] Prof. Monro has evidently searched the available sources of information, from the Dictionary of National Biography downwards, with great care and has spared no pains to get further information, with the result that he is able to present our profession with a valuable record of its members who have won distinction in other spheres. He includes within his purview the doings of men who became medical students, but failed to qualify, as well as of those who were members of another profession before taking up medicine. The field surveyed covers not only the church and the law, but scholars, soldiers, administrators, explorers, inventors, musicians, and even those who have distinguished themselves as pirates and criminals. Although the persons dealt with are chiefly British subjects, Dr. Monro takes note also of the achievements outside their profession by American and foreign medical men. As regards the church, according to one authority there are as many as 40 canonised saints, as well as three popes, who are said to have been physicians. The list also includes several bishops; the most versatile of these was Francis McDougall a colonial bishop, an Oxford rowing blue, an F.R.C.S. who further distinguished himself by his skill in shooting with a double-barrelled breachloader when a ship on which he was a passenger was attacked by a superior force of Chinese pirates. Many will agree with Prof. Monro that John Keats, who passed with credit as L.S.A. in 1816, is the greatest British medical poet; others will favour Robert Bridges, or Oliver Goldsmith "the most beloved of English writers" to whom Oxford University appears to have granted an *ad eundem* degree of M.B. in 1769, because he was already a medical graduate of Dublin. It is not generally known that Auenbrugger's treatise on percussion of the chest, issued in 1761, was made known in England by a review published by Goldsmith in the same year. Of minor poets, medicine appears to have supplied a very large number; the best known are probably Abraham Cowley and George Crabbe. Among the novelists and writers we learn that Tobias Smollett was an M.D. of Aberdeen, and Samuel Smiles a medical graduate of Edinburgh. In the list of discoverers and inventors it is of interest to note that the first diamond at Kimberley was identified in 1867 by Dr. W. G. Atherstone, who examined it with a polariscope and tested its hardness on a window. The diamond thus identified sold subsequently for £800. Timothy Bright, who invented modern shorthand and died in 1615, was a medical graduate of Cambridge. Henry Faulds, the inventor of the fingerprint method of identification, qualified at Glasgow in 1871, and published his fingerprint method of identification in *Nature* in 1880, thus obtaining priority over Bertillon who described a somewhat different and less valuable procedure in 1881. Another medical inventor who has not received his due credit is Charles Morrison, who in 1753 when in practice at Renfrew successfully demonstrated that messages could be conveyed by the passage of an electric current along insulated wires. Of medical pirates no less than a dozen are cited by Dr. Monro, the greatest of them being Thomas Dover.

[1] Arch. méd.-chir. de l'app. respir., 1933, viii., 289.

[2] The Physician as Man of Letters, Science, and Action. By Thomas Kirkpatrick Monro, M.A., M.D. Glasgow: Jackson, Wylie and Co. 1933. Pp. 212. 10*s.* 6*d.*

SHORT-WAVE DIATHERMY IN EXPERIMENTAL SYPHILIS

A FORTNIGHT ago a correspondent in our columns referred to good results obtained in treating syphilis by short-wave diathermy which induces pyrexia. C. Levaditi and H. de Rothschild [1] have tried this method in the treatment of *Treponema pallidum* infection in mice and rabbits and are not enthusiastic. The wave-length used was 22 metres, and the frequency about 15,000,000 cycles a second. The results lead them to suppose that when the current does have a therapeutic effect it does not kill the parasite merely by raising it to a temperature incompatible with life. On the whole its value was not equal to that of bismuth, organic arsenic compounds, or even mercury, and it seemed to have no appreciable adjuvant effect in conjunction with liposoluble bismuth compounds. No matter how many applications were given, the parasites contained in the residual chancre were unharmed. When applied during the period of incubation short-wave diathermy prevented the development of the disease in 50 or 60 per cent. of animals, or at any rate modified it to an occult form. It appeared also to have a favourable influence on the humoral reactions, though serological relapse was sometimes noted even when the chancre had apparently healed and the peripheral lymphatic ganglia were free from the parasite. It was also noted that it seemed to be more efficacious in long-standing syphilis than when the disease had been freshly introduced under the skin. The remedy was tried not only in experimental syphilis but also in spirochætosis of rats and mice, toxoplasmosis in rabbits, and trypanosomiasis, lymphogranulomatosis, and other diseases in mice. Summing up their experiences, Levaditi and de Rothschild maintain that short-wave diathermy has a definite therapeutic action in certain infective processes, either bringing about a cure or transforming an acute condition into a chronic one; it is of no use, however, in the acute and quickly fatal infections produced by spirillæ,

[1] Ann. de l'Inst. Pasteur, 1934, lii., 23.

trypanosomes, and ultra-microscopic viruses. Its curative and preventive action in established syphilis seems to them to be beyond doubt, but is unfortunately far from constant. Like other forms of thermotherapy, perhaps, it does not act directly on the infective agent but indirectly by stimulating the infected organism. They hold that it cannot be yet considered a competitor with the metallic compounds.

EPIPHYSEAL INJURIES OF THE LONG BONES

INJURIES to the epiphyses of the long bones are generally viewed with apprehension; the possibility of interference with the growth of a limb looms large in the surgeon's mind. It is encouraging therefore to find that Dr. Ernst Bergenfeldt, after an extensive study of epiphyseal lesions at the Maria Krankenhaus in Stockholm, does not think this complication is greatly to be feared. Altogether 310 epiphyseal injuries, in 295 patients, were studied. The patients were under treatment, either as in-patients or as out-patients, during the years 1919–1928, and most of the cases were followed for several years; only seven, indeed, were entirely lost sight of. Radiographic records are available of the end-results, and many of these are reproduced by Bergenfeldt in his monograph.[1] The immediate prognosis seems to be very good. Union and consolidation of the fractured ends and functional results were satisfactory in all but four cases (1·3 per cent.), in three of which there was shortening of the injured bone. *Subsequent* shortening, due to interference with growth, developed in 5 per cent. of cases; no case of stimulation of growth was found. Very considerable degrees of epiphyseal displacement were observed to be compatible with perfectly good results—a conclusion which has also been reached by E. L. Eliason and L. K. Ferguson,[2] of the University of Pennsylvania. The latter found that partial reposition of a single epiphysis was followed by normal growth and that deformity was not apparent finally. Because of the complicated form of its joint surfaces, accurate reduction is of great importance, however, in the case of the epiphysis at the lower end of the humerus.

Where growth is definitely inhibited the most probable cause is a direct lesion of the actively proliferating cartilage itself, though in compound injuries sepsis may be a factor. From the evidence of animal experiments, methods of fixation of juxta-epiphyseal fractures or of dislocation of epiphyses which involve transfixing the epiphyseal cartilage, have been suspect. Bergenfeldt believes that the danger to the growth cartilage involved in such operations has been exaggerated. He points out that, on the one hand, the cartilage is much more resistent to injury in man than in animals, and, on the other, that in the experimental animals employed the period of growth is relatively short and rapid, so that injury to the epiphysis has a relatively greater effect. He thinks that if care is exercised to cause the minimum of damage to the cartilage, it may be transfixed without undue risk. Of 24 cases with perforation of the epiphyseal cartilage only two had subsequent shortening.

Epiphyseal lesions at the upper end of the femur, of the type that give rise to coxa vara, have not been included in Bergenfeldt's monograph, because he has formed the definite opinion that trauma plays a very minor part in their causation. In this particular he distinguishes them from all other epiphyseal injuries, for in all other cases (with four tentative exceptions) the cause is held to be definitely traumatic, without any concomitant pathological change in the bone. It is interesting to note that the lower radial epiphysis has suffered much more commonly than any other site. In Eliason's and Ferguson's series of 110 cases, 48 were lesions of the lower radial epiphysis. In Bergenfeldt's series it was separated in 137 cases, with the lower humeral epiphysis second (70 cases), and the lower end of the tibia third (44). Boys suffer much oftener than girls, the figures being 232 and 63 respectively, and the injury is found most often between the ages of 10 and 17. Pure epiphyseal separation, without fracture of either diaphysis or of epiphysis, is a lesion of very early childhood. In half the cases the separation of the epiphysis was combined with a fracture of the diaphysis, but in only 6 per cent. with a fracture of the epiphysis. The worst prognosis seems to be in the cases (about 4 per cent. in this series) with epiphyseal injury accompanied by fracture of both diaphysis *and* epiphysis. A third of these showed ultimate shortening.

[1] Beitrag zur Kenntnis der traumatischen Epiphysenlösungen an den langen Röhrenknochen der Extremitäten. Acta. chir. Scand., 1933, vol. lxxiii., suppl. xxviii.

[2] Surg., Gyn., and Obst., January, 1934, p. 85.

TOBACCO AS AN OCCUPATIONAL RISK

THE International Labour Office, in the latest number of its encyclopædic "Occupation and Health," publishes an article on the effects of tobacco on those who manufacture it. Mild tobacco contains 1 to 2 per cent. of nicotine and strong tobacco 6 to 10 per cent. The poisonous substances include several allied alkaloids besides nicotine. Tobacco cultivators never suffer from poisoning, because nicotine is only liberated during fermentation. During the process of sorting, workers inhale the dust; during the fermentation they breathe injurious fumes, and in the manufacture they come into contact with the wet leaf. The local action on the skin and mucous membranes is an irritation. The consensus of opinion suggests that tobacco workers do not suffer more from tuberculosis or other diseases than workers in any other trade. They do not seem to suffer from pneumoconiosis, and there is no conclusive evidence that women workers miscarry more frequently or that their children are below the average of health. Natural fermentation does not usually contaminate the air sufficiently to affect the health of the workers, but artificial fermentation has been shown to produce a higher sickness-rate among the workers engaged on it than that recorded among workers on the slow process. The symptoms are those of typical nicotine poisoning. Beginners often suffer from an acute form of poisoning, with cerebral congestion, nervous symptoms, precordial pains, and intestinal disorders. Dermatitis has been described, generally on the backs of the hands, and an allergic condition can be established. The nails may be damaged; the free edge of the nail becomes thin, the nail comes off, and the dust causes a painful hyperkeratosis. Some authorities say that most workers suffer from sore gums and mouth. The workshop should, according to this article, be maintained under the best possible hygienic conditions and all possible dust should be removed. Contact with tobacco in any form should be limited as far as possible, especially in drying, stemming, maturing cigars, and manufacturing snuff. The fermentation premises should be separate and women and young persons should be excluded. The health of the women should be carefully watched, and pregnant women should leave work some weeks before confinement and not return for four or six weeks afterwards. Some French and Italian factories have found creches extremely useful. Many countries forbid the employment of children altogether, and

some countries forbid it in certain operations, such as stemming and sorting. Greece, Spain, Italy, and Switzerland limit the employment of women. In Holland occupational cramp among cigar-makers is compulsorily notifiable and compensation for disease is given in several South American countries. Although the medical evidence on the danger to tobacco workers conflicts, special legislation seems to exist in many States where tobacco is a staple industry, especially those in which conditions of manufacture may be presumed to be somewhat primitive. This fact is the most convincing testimony that tobacco manufacture is a potentially dangerous trade.

ERNST HAECKEL

NEXT Friday is the hundredth anniversary of the birth of Ernst Haeckel, who was for long the most popular and the best known biologist in Germany and possibly in the world. Prof. Ludwig Plate remarks [1] on the curious fact that his name is now scarcely mentioned in Germany and the publishers tell him that Haeckel's books no longer have any sale. And yet on the continent Haeckel did for the Darwinian theory what Huxley did for it in this country, that is to say, he brought the struggle for existence and its relation to the origin of species into the current thought of the people. Much of the terminology of biology was invented by Haeckel and the coins used are still stamped with his name; such are morula, blastula, gastrula. He had, as very few before or after him, a systematic mind and the intuitive feeling for the form of animals such as Linnæus had for plants. With the collaboration of the lithographer, Giltsch, his illustrated monographs made many of the lower groups of the animal kingdom familiar to the eye. But Haeckel's success as a biologist was overshadowed by his failure as a philosopher. His belief in the constancy of matter and the law of the conservation of energy eliminated from his universe such things as God, freedom of will or immortality, and his monism, although it involved him in some of the bitterest controversies of our time, failed to secure him any considerable circle of followers. Posterity is kind in forgetting about Haeckel as a philosopher but unjust in the shortness of its memory of him as a herald of the new biology.

ANALGESICS FOR CHILDBIRTH

THE use of barbiturates and other hypnotics in labour has lately been studied at the Boston Lying-in Hospital, and in several respects the conclusions reached [2] are in interesting contrast with those of a similar inquiry by Dame Louise McIlroy and Dr. Helen Rodway [3] at the Royal Free Hospital in London. Eight "types of anæthesia" were used, each being applied to at least a hundred patients. The drugs employed were: pantopon (omnopon) and scopolamine, pantopon and rectal ether, pernocton, sodium amytal and scopolamine, pentobarbital (nembutal) and scopolamine, sodium amytal and rectal ether, pentobarbital and rectal ether, and pentobarbital and paraldehyde. During the expulsive stage nitrous oxide and oxygen were given to all the patients, ether being added if required. Observations were made on respiration, blood pressure, and time of the infant's first breath after delivery, as well as on the anæsthetic effects of the different agents. The data do not greatly favour any one of the methods employed. In some restlessness and in others lack of amnesia are the defects. In none was there any evidence of danger to mother or to child. Pentobarbital and scopolamine produced 80 per cent. of complete amnesia, the highest in the study, and the greatest percentage of infants, 63, who breathed immediately after birth. The frequency of excitement, however, was considerable (16 per cent.). The opinion is expressed: "We do not believe that pantopon, morphine, or any of its derivatives should be used during labour, as they have a marked effect in delaying the initial respirations of the infant." This is directly opposite to the conclusion of McIlroy and Rodway that, all things considered, there is in the conduct of confinement no sedative so valuable as morphia properly used.

[1] Forschungen und Fortschritte, Feb. 1st, p. 51.

[2] Irving, F. C., Berman, S., and Nelson, H. B.: Surg., Gyn., and Obst., January, 1934, p. 1.

[3] Jour. Obst. and Gyn. Brit. Emp., 1933, xl., 1175; see THE LANCET, 1933, ii., 1493.

BOREDOM IN INDUSTRY

THE spur to activity supplied by the physiological need for katabolic processes in the rhythm of healthy life proves itself inadequate for the performance of industrial repetitive work. For economic production further incentives are needed. The report [1] before us is a study of the various factors conducing to the contentment and efficiency of persons employed on work which does not in itself promote the interest needed for a reasonable output. A group of girls working under ordinary factory conditions was studied. First a fixed weekly wage was paid; then a competitive bonus system was introduced—with excellent results on output; lastly a flat piece-rate was tried, and this gave even better results. Payment by results, appealing as it does to personal gain, gives additional interest to work, but at the same time it stimulates selfish and assertive tendencies. The more capable workers are pleased; the less capable become discouraged when their workmates obtain higher wages, and suffer in happiness and maybe in health. Here the remedy lies in grouping together workers of similar capacity. Success creates pleasure; although doubt may arise whether a girl likes her work because she does it well, or does it well because she likes it. On the other hand, unpleasant work inhibits performance; but all persons do not find the same process unpleasant. Most factories provide many types of repetitive work, and a distribution of workers so that each is employed on the process which makes the strongest appeal is capable of greatly increasing efficiency and pleasure in work. The influence of a neighbour is considerable. An assertive member usually dominates a group, favourably if she be capable and industrious, adversely if she be talkative and slack. A capable worker tends to lose more in output, when placed next to an inferior one, than the latter gains. Friction is caused when incompatible temperaments are thrown together for the greater part of their daily life while at work. Where the conditions are so monotonous as to engender boredom, unconsidered trifles may be a fruitful source of pleasure or discontent; the importance of these is seldom realised by the manager. Attention should be centred on removing factors which are impeding production, before introducing incentives—just as a driver takes off the brakes before using his accelerator. Boredom, although a reality in industrial life, is mental in origin and requires mental remedies; it is something apart from manual dexterity. Output is not merely a function of the length of working hours, which can be forced to its maximum by cleverly devised wage payments.

[1] Incentives in Repetitive Work. S. Wyatt, with L. Frost and F. G. L. Stock. Indust. Health Research Board. Report No. 69. H.M. Stat. Office. 1*s.* 3*d.*

BRITISH INDUSTRIES HOUSE: A MEDICAL COMMITTEE

British Industries House, the large structure recently put up by Messrs. Gamage at the corner of Park-lane and Oxford-street, London, has been acquired by a combination of the following companies: the London Life Association, Ltd., the Scottish Widows Fund and Life Assurance Society, the Equitable Life Assurance Society, the National Provident Institution, the National Mutual Life Assurance Society, and the Provident Mutual Life Assurance Association. The building is being transformed into the centre of a constructive scheme whereby the manufacturer of British goods can bring his wares readily to the notice of buyers. The interest has been secured of the Department of Overseas Trade, of the Scottish National Development Council, and of certain important chambers of commerce, and a sound project for the promotion of British trade is being set on foot. The interested insurance companies have now decided to institute a medical department in which British manufacturers of medical supplies will be able to show their representative products. Such a centre should be of real service to those who have to cater for hospitals, while buyers of all sorts will reap the advantage of finding their various wants met under the roof of one building. The directors of British Industries House have thought—and thought wisely—that, in order to ensure such a department being run on lines approved by the medical profession, a small committee ad hoc should be made responsible for this section of the work. The committee has now been so far appointed that Dr. Alfred Cox, Sir Crisp English, Dr. E. P. Poulton, and Mr. A. R. Melhuish, past president of the Pharmaceutical Society of Great Britain, have accepted membership, Dr. Cox being chairman. This is a very appropriate body to advise the directors in situations where their general policy should be guided by health considerations.

THE COMPLEMENT-FIXATION TEST IN GONORRHŒA

THOUGH serologists for some time past have been prepared to admit that the complement-fixation test has its value in the diagnosis of gonococcal infections it is only by slow degrees that it is taking a routine place in venereology. That, in this country, it can now be considered a reasonably standardised test is due to the continuous and patient work of a group of pathologists who, beginning their investigations in the army during the late war, have subsequently pursued them in the venereal diseases department of St. Thomas's Hospital and elsewhere. In the earlier history of the test the main difficulty was in preparing a sufficiently sensitive specific and stable "antigen," but the consecutive work of D. Thomson, T. E. Osmond, and I. N. Orpwood Price seems to have solved this difficulty. The London County Council has lately published a useful report by Dr. Orpwood Price[1] in which the technique and uses of the test are discussed in a practical way. The "antigen" he recommends is an NaOH extract of the gonococci, subsequently brought to a pH of 7·5. This antigen, if kept in the cold and in a sterile condition, is said to keep its properties indefinitely. The test is made quantitative by the use of two complement doses—serum and "antigen" amounts being kept constant. Cross-fixation with sera from other neisseria infections is negligible and, if the test is properly carried out, hardly ever gives rise to difficulty. In the male, during the early acute stage of the disease, the test may be negative, but by the second week 46 per cent. of positive reactions occur, and the proportion of positives steadily increases until it reaches 100 per cent. by the fifth and sixth weeks. In the female, though the test is negative during the initial simple urethritis, it is almost always positive when deeper structures are involved and when the disease has become chronic. It proved positive in 14 out of 17 cases of gonococcal vulvo-vaginitis in children. The test is also valuable in assessing cure of the disease and freedom from infection. Dr. Orpwood Price's report ought to stimulate clinical pathologists to renewed interest in a test which for some years past has been unduly neglected.

[1] The Complement-fixation Test for Gonorrhœa. Report published by the London County Council, 1933. London: P. S. King and Sons. Pp. 30. 6d.

MICROSCOPICAL STAINS OLD AND NEW

MICROSCOPISTS are only too well aware of the variability of results obtained with different samples of stains presumed to be the same. With this in mind, the council of the Royal Microscopical Society last year appointed a committee to consider the standardisation of biological stains and staining materials manufactured in this country, and to recommend standard specifications and tests for adoption, with a view to the certifying of manufactured stains conforming to such standards. Besides Fellows of the Society, this committee includes representatives of the Medical Research Council, the Royal Society of Tropical Medicine and Hygiene, the Institute of Chemistry, the Chemical Society, the Society of Chemical Industry, the Pathological Society of Great Britain, and the Physiological Society. It has already held several meetings, and the drafting of standard specifications for acid fuchsin, methylene-blue, and eosin is well advanced. Other stains will be dealt with as soon as tests of those in hand have proved them to be satisfactory. In addition, a standard specification for xylol for microscopical purposes is receiving attention. Referring to the work of the committee in his address at the annual meeting, Mr. Conrad Beck, the retiring president, expressed a hope that it might also lead to the introduction of new materials and new technique. In particular he thought there was scope for the use of differential stains designed for dark-ground illumination. "Those who have examined stained specimens of bacteria by dark ground must have been astonished," he said, "to see how vividly the tubercle bacillus stands out as a brilliant yellow against the faint red pus cells, how much more quickly it is recognised than with transmitted light, where it appears as a faint pink. The anthrax bacillus stained with methylene-blue appears blood-red by dark ground. The malaria parasite within a blood-cell, wanting care to discover by transmitted light, simply leaps to the eye by dark ground. There may be reagents or stains that would differentiate structure viewed by this means to a greater extent than can be done with transmitted light."

INDEX TO "THE LANCET," VOL. II., 1933

THE Index and Title-page to Vol. II., 1933, which was completed with the issue of Dec. 30th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, London, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

THE PREVENTIVE ASPECTS OF MEDICINE

A Series of Lectures in progress during the Winter Session at King's College Hospital Medical School

XIV.—THE PREVENTION OF RHEUMATISM

THERE are few more difficult problems in medicine than the study of rheumatism. I have devoted the best years of my life to the subject, and, if this can be taken as proof of difficulty, I say that I am as deeply interested in its problems to-day as I was nearly 40 years ago.

METHOD OF APPROACH

Let anyone here consider how they would have attacked such a problem as the prevention of rheumatism in the last century. I think they would incline to do as I did: that is, choose a type of the disease which older investigators had already pointed out as remarkably definite and a type which may prove fatal, not commonly it is true, but not infrequently; one which can for this reason be diagnosed with considerable accuracy, and be investigated not only clinically but pathologically. That type is the acute rheumatism of childhood. I have seen hundreds of cases and investigated many with my late friend and colleague Dr. Alexander Paine and others, bacteriologically, pathologically, histologically, and clinically. To-day I assert that this type of rheumatism is as definite a disease among a group of allied diseases as one can expect to find in the human being. When I say this I mean that in the morass of the subject of rheumatism, there is one landing stage on which we can stand with some firmness.

At the end of the last century experimental heart disease had never been produced in this country with an organism obtained from active rheumatic lesions. Experimental arthritis from the same source was unknown, as also other important rheumatic lesions. Imagine the difference that these experimental results made.

I shall not weary you with the story of how we (Poynton and Paine) arrived at our belief, but would put it in its exact form which has often been misrepresented. It was that we believed a diplococcus or strepto-diplococcus was a causal agent of acute rheumatism in childhood and seeing that the disease was so special in character we thought that there probably was something special in that strepto-diplococcus. We never said, and I have never said, that the micrococcus was specific, but we expressed the belief that it was a causal agent, possibly the only one, and the reaction of the tissues a factor in the production of the distinctive disease—a difference in my opinion of real importance.

I may add that every obstacle conceivable and inconceivable has been raised against this view. These can be well summed up in a criticism I once read, but forget where. It was to this effect, that rheumatism was probably due to a strepto-diplococcus but not that described by Poynton and Paine. This is so delightfully English and pleasantly humorous that what better than this criticism could anyone want? Thirty-five years have passed and England reeks with rheumatism, but we are still struggling to get nearer the truth of the causation of "rheumatism."

The immediate consequence of our investigations was the conviction that the acute type of rheumatism should be prevented, just as one would aim at preventing tuberculosis or the typhoid group. In time everyone will be driven to see that the study of rheumatism begins in childhood, and at the very dawn of the illness; that the lessons of infective heart disease must be learnt from the child; that prevention, though not perfect, must be the constant aim particularly through early life; that the irreparable lesions, such as mitral stenosis, must be studied and worked at through the general and consecutive study of child rheumatism until its course is more throughly understood; finally, that malignant endocarditis, which I believe is often directly due to rheumatism, must be investigated from that standpoint.

ACUTE RHEUMATISM A CONSTITUTIONAL DISEASE

There is very considerable danger that the study of rheumatism will be checked and made more complex by the continued development of specialisation.

I do not think that a study of the prevention of typhoid fever would be assisted if the rose spots were handed over to the dermatologist, the enlarged spleen to the specialist on reticulo-endothelial diseases, the bronchitis to the pulmonary specialist, and the diarrhœa to the alimentary expert. Yet this may be expected in rheumatism, when only recently I saw a case and was told by the patient not to trouble about the heart for that had been examined by a cardiologist! We hear of arthritic centres and cardiac centres, and orthopædic centres and throat and nose centres, yet we know that acute rheumatism attacks heart, joints, nerves, throat, and so on, and that it is a great constitutional disease.

I believe the thorough method of studying rheumatism is not by specialising on one or other manifestation. Someone must approach rheumatism as a constitutional disease unless we are to find confusion worse confounded.

How can we possibly expect to do much for the prevention of acute rheumatism if we only study that disease, or worse still one manifestation of that disease? How can we judge whether we are advancing or not? How can we feel sympathy with those who approach the problem from other aspects, in other climates, or even in other cities, or from the bacteriological side, or endocrine aspect, or nervous aspect, or biochemical aspect if we do not study rheumatism together with general medicine? We must know not only the history of rheumatism, but of other great constitutional diseases, for if from lack of broad vision we cannot see the good in other people's work, even if we disagree with them, how can any doctors lead the study of the prevention of rheumatism?

Who, one asks, in the future, apart from the parents, will be the protectors of children threatened or suffering from a constitutional disease such as rheumatism? Clearly the doctors in general practice who, as things are moving now, seem to me may be alone likely to possess a general knowledge of human illness. Supported as they should and must be by increasing facilities to obtain assistance, and drawing nearer to the consultant, they will be the first line of defence. We must learn to be sensible and allow that those who see many cases, who are deeply interested, and have special knowledge and facilities for research near at hand, must be able to help those who see few cases in their practice. Those however in that position should surely have knowledge of heart disease, arthritis, the nervous system, and so on. They must know the constitutional disease acute rheumatism, and more than this they must know about other great constitutional diseases.

The general practitioner and the consultant with special knowledge and a wide survey of medicine are two of the chief individuals concerned with the prevention of the disease. One sees the early stages

of rheumatism, the other is in touch with modern advances and is the possessor of special experience. Between them stand others concerned with coördination and administration and special lines of approach.

THE DANGERS OF DOGMATISM

It is necessary to beware of dogmatism, and that lesson is to be learnt in children's hospitals. It is natural to take a line, and perhaps in so doing to exaggerate its importance, but such words as infective and non-infective, primary endocrine dysfunction, primary errors of metabolism, and allergy must be used with caution.

Take for example Still's disease, which has been swept into rheumatoid arthritis, that is, changed from one unknown group into another. If it is rheumatoid arthritis one can at that age put aside, I think, prir ary endocrine dysfunction. Every feature of rheumatoid arthritis points to infection even if that infection be unknown. That there may be rheumatic endocrine disorders no one can deny, for there is no *a priori* reason why the subtle poisons of rheumatism should not damage the endocrine organs. We may not yet be able to recognise that damage, or if it is recognised, it may at once be claimed as the primary cause, but possibly with too much dogmatism. This I say with the more certainty because I have seen exophthalmic goitre result directly from acute rheumatism, not as a subsequent development, but as part of the actual illness. The endocrine damage was then secondary and not primary. If the thyroid can be directly damaged, why should not then other endocrine glands be damaged, not perhaps in a child of 3 years but in an adult? Again in childhood it is difficult to disentangle acute rheumatism from allied conditions and even the term "a specific disease" is only a relative one. Thus it becomes clear that the study of rheumatism in the young will also open up in the future the subject of the prevention of rheumatism of all kinds and at all ages.

These are examples of my meaning. I have seen in Still's disease (together with cervical spondylitis) severe valvular disease of the heart. I have seen a case of acute rheumatism with carditis, chorea, and nodules end with enlarged glands, an enlarged spleen, and an arthritis which everyone of you would say was typical of Still's disease. In acute rheumatism, I have seen children develop bony nodes from periosteal inflammation, and the prominences of their condyles and of their ulnæ and radii "grow out" from the same reason. Heberden's nodes are not so different and indeed may occur in rheumatic children, and they are looked upon in the elderly as evidence of mild arthritis deformans. Then I have seen in acute rheumatism children with clawed hands and transient Dupuytren's contractions from fibrositis of the palmar fascia; with general fibrositis: with lumbago, and repeatedly with hands and fingers indistinguishable from those of acute rheumatoid arthritis. Then again, I have seen in acute rheumatism, vascular spasm and cyanosis such as so often occurs in rheumatoid arthritis. It is clear that many difficulties surround too ardent a dogmatism.

Once more, what is known of the life-history of prolonged infection in man and of the changes that may occur as the direct result of slow infection, and of the secondary results in the resulting damage to internal organs or to structures already worn out by wear and tear and old age, and in fact to the whole constitution? Why this slow course in some cases and not in others? Not enough is known, I think, to justify dogmatism. Is it known accurately as accurately, that is, as about the staphylococcus, how long the streptococcus may linger in the tissues? In fact the distinctions drawn between the various rheumatic affections frequently do not correspond with clinical evidence, though these, like poor relations, may be conveniently ignored.

Here I may best make a brief allusion to allergy. I have heard acute rheumatism called an allergic disease and this is a seductive explanation; but it should be remembered that those engaged in the actual study of allergy both write and speak of bacterial allergy with the greatest caution and restraint. If by an allergic disease it is meant that a first attack of acute rheumatism with pancarditis is allergic I frankly challenge the statement. If it is meant that symptoms of allergy may develop in the rheumatic I say it is probable that a streptococcal disease may cause a tissue sensitisation to streptococci as a result of repeated doses—a very different matter.

How often in your lifetime, do you imagine, do you get small doses of streptococci, whether hæmolytic or green? How different, do you imagine, may be your response to them when you are caught in ill-health or when you are a child, or a woman, or an old man, or a rheumatic? The answers are not easy to give. I hope, nevertheless, you will not think that I am contending that the only platform in rheumatism is the acute rheumatism of childhood. From the platforms of rheumatoid arthritis and osteo-arthritis also much has been learnt. I only deprecate a too hasty dogmatism, and express my belief that the prevention of rheumatism in childhood is but little distinct from the prevention in the adult. It is more urgent, but it is simpler, for we are not befogged by the complications of wear and tear, mental anxiety, occupation, alcohol, sexual maturity, and the degenerative processes of old age. These then are some of the difficulties and pitfalls which surround us over prevention.

PREVENTION: CLIMATE AND SURROUNDINGS

Rheumatism, with our present knowledge, cannot be entirely prevented, and has frequently to be met and obstructed when it has already done harm. The army is actually in the country, and the defenders have to fight it losing a town here, and a hill there, but striving to keep the vital points protected.

At the outset there are the climatic difficulties. It is known that autumn and spring are seasons when, in childhood, rheumatism certainly occurs more frequently. I go perhaps a little further and suggest that it is the sudden changes in temperature which are particularly dangerous.

How is it possible to cope with these climatic changes? Only, I fear, as yet very imperfectly, by trying to guard the children more carefully at those times, and how many parents are able or think to do this? Doctors, supervisory centres, propaganda, and after-care workers are all doing a share and I believe all doing good, but at the moment no standard is available for guidance but common sense and a knowledge of rheumatism. The statistics collected by the Ministry of Health give some encouragement. Different years however may give different figures and though each year is of value, time will be needed to assess their exact value.

Then there are the surroundings, and here it is necessary to distinguish between those that may favour the cause of acute rheumatism and those that may influence its after course. Sir A. Newsholme long ago pointed out that rheumatism was an urban disease rife when the level of surface water was low. I associate this with a prevalence of sore-throats, that is, with an exciting cause of rheumatism, and, in my opinion, last autumn afforded a striking example. I believe that the late Dr. Carey Coombs and his co-workers in Bristol clearly showed that the rheumatism there was closely related to overcrowding, and that Dr. A. P. Thomson showed in Birmingham that rheumatism was more frequent along the track of river courses. I believe also, with others, that

houses built without damp courses, with thin walls and warping doors and window cases, are a danger, especially if they are built upon cold clay or surrounded by trees. It is difficult to fight against this kind of house. I am also convinced from direct experience of the danger of damp rooms, especially if these lack sunlight and are in basements. These factors I believe influence the course of rheumatism.

PREDISPOSITION

Some believe, myself included, that there is a *family predisposition*. An analysis of Dr. Cheadle's private case books showed this to occur in about 80 per cent. of cases, but the biochemistry of such a predisposition is still unknown.

Some hold that there is apart from the infection an *acquired predisposition*. Yet even if cases are studied with every care it is difficult to put a finger on any particular diet or carelessness that breeds this predisposition. It must be remembered that many children develop rheumatism under 5 years of age and this gives them a very brief time in which to acquire a predisposition. Whether all the diets detailed in books on child management are good or bad I do not know. Personally I am pleased that neither my body or brain was nourished upon some of them, but I do not think they breed rheumatism. I do not even think to be roused for a tablespoonful of grape-fruit predisposes to chorea. Clearly those who believe in acquired predisposition, whether or not one agrees with them, are doing great good by insisting upon the care of children, and this work may lead to the elucidation of some new facts of great importance.

At the present time fats are out of favour with the public, especially the female public, and Dr. E. C. Warner has directed attention to the dislike of rheumatic children for fat. Fats are certainly the most expensive foods, but this may have no bearing upon the question, and I have no intention of entering upon the calorie controversy. My difficulty about diet has always been how to account for the greater frequency of rheumatism in female children, for I don't think they "slim." The sister of my ward—a first-class observer—tells me she has not found in the many rheumatic children she has had under her care any striking dislike for fats and I would add that she has been my ward sister for over ten years. She knows that I always treat my rheumatic children with an ordinary diet, when once the acute illness is over, although I have always read that the protein foods are a danger. I think Dr. Warner does good service in directing attention to a nourishing all-round diet for the rheumatic, and the only difficulty is for a poor woman with a large family to get such a diet for her children. Good food is probably an element in prevention, though to be candid my experience of a first attack of acute rheumatism is that of an acute infection irrespective of diet; but I admit it is easy to err and wise to learn with an open mind.

SCHOOL LIFE

The environment offered by the great State schools with their many pupils must be considered in connexion with the danger of the "sore-throats" which sometimes develop even among us, who are not pupils, in great number during the changeable seasons of the year. The most hardened sceptic can hardly deny that tonsillitis is a frequent precursor of acute rheumatism. If there is such a one I would venture to remind him or her that this has been recognised for about 150 years, and in recent days has been proved again and again, and that Dr. Paine isolated the diplococcus from acute rheumatic tonsillitis and produced with it carditis and arthritis 34 years ago. The child is necessarily exposed to these infections in the schools, as are others in ordinary life. Then again under what conditions and from what homes, as others have insisted, do some of these children come to school? How many realise their sensitive nature and who knows the exact relation of rheumatism to the nervous system? It is easy to recognise gross chorea, as one would recognise that his house, built on shifting sands, has one day fallen down by seeing its ruins, but that seems to me a little late.

Prevention during school life must be difficult. It is hard indeed to evade a "droplet." Each year, however, progress is being made by additions to knowledge of infection, by supervision, by instruction, by intervention. It is recognised more and more that children go to school very young, too young in my opinion, and should be carefully guarded. To Sir George Newman and his staff and to Dr. Alison Glover, and to the school medical officers, both State and private, the public owe a debt of gratitude and one which will increase in years to come.

If one compares the pupils of the unfortunate private preparatory schoolmaster and his harassed wife, his matron and nurses, his numberless precautions and the anxious and ruthless parents, with the pupils at the State school some light is thrown on the reasons why rheumatism is so frequent during the school age in this climate, and in large cities particularly. There has never seemed to me any mystery about this. Acute rheumatism is in my experience unusual in the private preparatory school though far from being unknown, but this relative immunity must be considered in relation to what I have just mentioned: the numerous precautions, the expense of those precautions, and the children who are detected as out of health during the holidays, and are kept away perhaps for some weeks or even a term to regain their health.

The education of masses of children and particularly young children is often, I think, carried on at a cost to their health, but would the cost be less if they remained behind in many of the poor homes? I have not the slightest doubt that there is a movement forward to what may be termed *a greater humanity* in this problem, but it is always liable to set-backs when times are hard and seasons unseasonable. I believe that the greater care and supervision of children is beginning to tell and that the Ministry of Health inclines also to that opinion.

THE HOSPITALS

In the hospitals too, where the severer cases are treated, I think there is a forward movement, due partly to the realisation of the stubborn nature of the disease, the insidious onset of relapses, and the need for slow convalescence and for care in taking the first steps of active exertion. The hospitals are getting in closer touch with doctors, with health visitors, with the after-care of the children, and welfare centres. I have had rheumatic hospital patients under my supervision for 10 or 20 years, first at Great Ormond-street, then at University College Hospital, and have guided them into employments which I thought were suitable. It is becoming more generally recognised that many children who have been damaged by rheumatism can become useful citizens in suitable employments. This is a factor of prevention in the wider sense that prevention of rheumatism, which cannot be perfect, includes the prevention of the results that may follow from its damage, and I believe that overstrain of such patients by lowering their resistance may lead to further attacks.

SUITABLE EMPLOYMENTS

There are difficulties in finding suitable employment apart from the obvious one dependent upon the slender resources of the poor. A deeper knowledge of employments suitable for the rheumatic in this treacherous climate is required. For a man to lift heavy weights when suffering from an aortic lesion is clearly quite unsuitable. But it must also be remembered that employments entailing much nerve strain and yet no severe physical exertion are not well borne, neither are long hours in stuffy, dark, damp rooms. These young people need some fresh air and decent exercise. The study of suitable employments is a step in the prevention of rheumatism and its results that requires more investigation. It is a part of the valuable inquiry into the life-history of rheumatic diseases and a part of a greater humanity.

SPECIAL HOMES

Special convalescent homes for rheumatic children develop essentially to fill the need of the cardiac cases, because the heart disease is the great menace. Experience handed on to me from Dr. Cheadle had shown me that to send children who were barely convalescent from an acute rheumatic attack to homes where children were convalescing from surgical injuries or only required fresh air and good food repeatedly resulted in the delicate rheumatic child getting overdone. There are few worse chapters in the history of rheumatism than that which is concerned with the overstraining of the heart of a child recently the victim of a cardiac attack and perhaps not really convalescent. It was evident to me at any rate that such children required special care and supervision. If this can be given in a comfortable home with careful parents and a good doctor the need for the special home perhaps does not exist, but it is well known that acute rheumatism is prevalent among the poorer classes in large towns and their homes at this stage of rheumatism may not be suitable.

No claim could be made that such special homes are curative except in this sense, that Nature is the healer, and skilled (and I lay stress on skilled) rest and re-education gives Nature every chance in a special home on a suitable site, sunny, dry, and lying rather high. It is clear that an utterly damaged heart would not return by these measures to the normal, and that the cases most suitable are those of early dilatation and comparatively slight organic valvular disease, and these are the very ones in which due care meets its best reward. But these homes are capable of doing much more than this, for in them the child is kept for months under observation and much can be learnt, and is being learnt, of the real history of the disease.

It has been objected that the results do not justify the expense; that outbreaks of tonsillitis may spread and arouse the rheumatism to activity in a group of children and that the children relapse when they go home. Now if these children do repeatedly relapse when they return home the fault does not lie with the special convalescent home; on the contrary it is a proof of its intrinsic value. It is indeed evidence that our profession cannot stand still, but must, however great the difficulties, make every attempt to discover *why* children do relapse when they go home. In other words we must discover more about the ætiology of the disease and the actual danger of these home surroundings. Some children may relapse on returning to their homes, but many I am sure do not. That they relapse in the special homes is not in my opinion a frequent occurrence and in general terms these children greatly benefit.

I am sure there is more to be learnt about rheumatism from prolonged study in such homes than from a study such as I have had to make—namely, the study of an acute attack, then a gap—and then the study of another acute attack. Yet I have been fortunate because in cases which have come on to me at University College Hospital from Great Ormond-street I have been able to trace much of the history of mitral stenosis, mitral and aortic disease, pericarditis, chorea, and malignant endocarditis. Even then there have been serious gaps, and now these are being filled in by special convalescent homes, and arduously and slowly it may be, for the subject is difficult, the real history of rheumatism is being learnt.

A special home where a child is just kept in bed until everyone is tired of it is useless. Such a home should be in touch with the best available hospital and be in the hands of those whose desire is to learn all that can be learnt about rheumatism. An outbreak of sore-throat may spread among rheumatic children as among other patients and this danger once recognised must be met by skilled watchfulness and immediate isolation of the first case, that is if we really believe rheumatism to be streptococcal in origin and do not believe it only when these homes are to be condemned. The number of such outbreaks are few compared with the number of cases treated in these homes, and now the danger is realised it is promptly dealt with. It must be remembered, too, that rheumatic children may get sore-throats in their own homes, at school or in the streets, or even at the "pictures."

Among the things that have been learnt from these homes is that the latent period between a sore-throat and the appearance of active rheumatism may be as much as three weeks; this subject has been carefully studied by Dr. B. Schlesinger, Dr. Glover, and others. This is of practical use, particularly when a child of rheumatic tendency develops a sore-throat. It has also emerged with certainty that the clinical symptoms of such sore-throats may be so slight as to be easily overlooked and yet may be followed by severe rheumatism, a point upon which I have repeatedly dwelt.

The value of the sedimentation-rate of the blood is being practically investigated in these homes, an important investigation this, as is also a further study of the clinical history of the rheumatic nodule. The whole problem of rest and re-education to a normal life, the limitations of this re-education and the set-backs are being closely inquired into over long periods of time. The night and day pulses are being studied and the influence of adolescence on the course of the disease. Any new treatment can be at once tested and its practical value foreshadowed without bias and without the sounding of trumpets.

I hold that in these homes some of the most difficult problems of rheumatism can be approached to great advantage with the assistance of the careful records and follow-up precautions employed. The abandonment of these special homes would be a retrograde step which would break a link in the chain of assistance being given to the rheumatic.

The idea underlying their establishment is sound, the need for them is great, and sufficient time has not been allowed for their full value to be assessed.

SUPERVISORY CLINICS

Supervisory clinics are clearly of much value, but they also need time to fit themselves into a campaign of prevention. They stand as it were in the middle of cross roads made by the family doctor, the hospital, the school, and the home. They work, much as I have done, with gaps in the intimate knowledge of the actual illnesses. They act rather like policemen, guiding the traffic, guarding the children, directing uncertain travellers, and keeping the child population of the rheumatic in touch with all other measures of assistance.

THE TONSILS

As a means of prevention enucleation of the tonsils in childhood has been much debated. The difficulties are, I think, exaggerated because some definite facts are available. It is known that the tonsils are not the only vulnerable parts of the nasopharynx; that children may suffer from a severe attack of acute rheumatism when the tonsils have been skilfully removed years before, and that if they are removed after a first attack recurrent attacks of rheumatism may develop in which we see, not inflammation of the tonsils for they are gone, but a general redness of the nasopharynx. Then on the other side it is known that there are cases where the tonsils are obviously unhealthy, and every time a child has trouble with them it develops signs of acute rheumatism. It is also known to many that children who have these inflamed tonsils and warnings of rheumatism are restored to health after the tonsils have been removed and have remained free from rheumatism. On the other hand again I have seen, as doubtless others have seen, a flare-up into a fatal carditis following enucleation of tonsils during an attack of rheumatism or in early convalescence. Everyone knows that accidental deaths and severe illnesses may occur during or after tonsillectomy and more often, I assure you, than many would like to admit. I believe strongly, but I do not know, that the removal of tonsils which have not given trouble and are apparently healthy is to cut off one of the important lines of defence against systemic infection.

The reasoning from such facts as these, and in my case also from my belief, is clear. No tonsils should be enucleated unless one is convinced that they are a danger to health, and then the opportunity for the operation should be carefully chosen. I have never seen any reason for wholesale operations on tonsils, just because they are tonsils, in order to prevent rheumatism, because this argument is not a sound one. Everyone is left with difficult decisions but that is the fate of doctors in all human illness and that no doubt is why we need to know not only theory, but the common sense of things.

RHEUMATISM INFECTIOUS?

I have not touched upon the epidemic and infectious aspects of acute rheumatism. I have seen local epidemics in north London, for example, and I have had direct experience of instances of two children sleeping in the same bed and one developing chorea, the other arthritis or carditis. Years ago Sir A. Garrod in his treatise on rheumatism clearly recognised epidemics and in fact many things we think to be new, for his book was born ahead of its times. I hesitate to present my favourite children to an allergic public, possibly spurred on by alarmists in our profession who may intensify without due reason the infectiousness of acute rheumatism. I consider the time is not ripe—if indeed it ever will be—to look upon a rheumatic child as infectious. Neither will I dwell upon the sterilisation of young women with mitral stenosis or upon the marriage of two rheumatic individuals, for to me Life is something deeper than obvious materialism. We may advise; it is our duty to advise and warn of dangers and of possible sorrow and regret. My Victorian mind takes me no further.

THE GRAVITY OF ACUTE RHEUMATISM

There is a vast amount of rheumatism in this country, and the problem of its prevention is a very formidable one in which the child takes the foremost place. Of all countries this one can least afford not to study rheumatism with determination, skill, and obstinacy. The problems for the adult are if possible less understood, though not so actively dangerous. We may, for example, give an engine driver an expensive treatment and then when he goes back to his draughty engine he gets lumbago again, though may be we have done our best. Surely for children we can do better? We have the time, before they begin to earn their living, to do better and increasingly better than this and in thus doing we are striking at the root of rheumatic heart disease. I have seen enough of the results of rheumatic heart disease in the adult to recognise that we can and do help them during their downfall, but to realise that the only hope for the future lies in the study of the prevention of rheumatism in the child. This is a splendid problem to attack, and though for centuries we have been baffled by the problem of rheumatism we have now at least one line of approach.

CONCLUSION

The most encouraging words I have received came years ago from a leading doctor in America who wrote to the effect that, whatever might be right or wrong with the details of our investigations, they were satisfied that they were a working basis for prevention and supervision, and thus America led the way in this advance. Prof. Gustav Singer, Prof. Jensen, Dr. van Breemen, Dr. Homer Swift, and many others have met me, written to me, or sent me their assistants to discuss this problem of rheumatism and its prevention. This I mention because I would not have you think that I speak as a representative of a gang of cranks, much less a solitary crank.

Let us then keep in the van of progress, and though we may differ in our views upon details, all be united upon one main issue—the prevention of acute rheumatism and the mitigation of its results in childhood. For over 35 years through darkness and doubt, praised or ignored, I have never swerved or thought to swerve from that path which leads to the protection of the rheumatic child and towards the prevention of organic heart disease in early life. I know and my heart is gladdened by that knowledge, that there are young and able doctors in all parts of this country and the world—for they write to me kind letters—who, whether they agree with my views or not, are as determined as I have been to fight for the child victim of acute rheumatism, and to strengthen our knowledge of its prevention.

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HOSPITALS AND THE COST OF MILK.—The British Hospitals Association has received many complaints of the enhanced cost of milk resulting from the new officially fixed prices. The secretaries of a number of London hospitals estimate that the following additional monthly expenditure is being incurred: St. Thomas's, £120; the London, £100; Guy's, £70; National Temperance, £40; Charing Cross, £37; Queen Charlotte's, £33; St. George's, £31; St. Mary's, Paddington, £30. An official of the London County Council is said to have estimated that the extra expenditure upon milk for the council's institutions will this year be "about £55,000." Mr. Walter P. Cobbett, chairman of the Manchester Royal Infirmary, is reported as saying that the additional cost to that institution will be £1300 a year. At the same time it is pointed out that the over-production of milk is so great that it is being sold for manufacturing purposes at 4*d*. per gallon.

SPECIAL ARTICLES

MEDICINE AND THE LAW

The Coroner of the King's Household

THE death last week of Mr. A. W. Mills creates a vacancy in the coronership of the King's Household. This ancient office, saved in 1926 when Parliament prospectively abolished so many other franchise coronerships, is more honourable than onerous. In a tenure of over 45 years Mr. Mills, it is reported, held only three inquests.

Henslowe Wellington's two volumes on the King's Coroner reproduce as frontispiece a seal, now in the British Museum, bearing the legend *S. Coronat. Hospic. Dni. Regis*—the seal of the coroner of the Household of our Lord the King. Described in unheraldic language, the design represents two main objects, a rod or staff, dividing the surface from top to bottom, and a wheel. The rod must surely be the wand of office or "verge," derived from the Latin *virga* and the origin of our English word "verger." The verge, originally a badge of authority, came to signify the area of authority. To be "within the Verge" was to be within the compass of the King's Court (possibly symbolised by the wheel) bounding the jurisdiction of the Lord Steward of the Household. For this area there was a special coroner, sometimes called the coroner of the Verge, sometimes the coroner of the King's Household. The Verge is the larger district; according to a statute of 1389 it extended 12 miles from the King's lodging. The Household is the smaller; an Act of Henry VIII. defined it as including the King's palace or house, together with any orchards, gardens, privy walks, tiltyards, woodyards, tennis plays, cockfights, and bowling alleys belonging thereto. With whichever of the two areas the coroner is associated it is natural and proper that he should be appointed by the Lord Steward, who is Lord Great Master of the King's House. When all the old law about coroners was modernised in the Act of 1887, Section 29 dealt with the coroner of the King's Household, his appointment, his declaration of office, and his jury of officers of the Household, and made it clear that his jurisdiction has shrunk. He no longer has authority to the full extent of the Verge; his jurisdiction is limited to the palace or house where the sovereign is personally in residence, together with the courts, gardens, or other places within the curtilage of the palace or house; if the dead body is in any place outside the curtilage, the county or borough coroner has jurisdiction "in the same manner as if that place were not within the Verge." The serious motoring accident a few weeks ago on the pavement outside the railings of Buckingham Palace presumably took place within the Verge but outside the curtilage. The bodies were not brought inside the curtilage afterwards but were taken to hospital or mortuary elsewhere, so no question of the jurisdiction of the coroner of the King's Household arose.

Section 29 of the 1887 Act mentions that the limits of the coroner's authority are not to be affected by the sovereign's subsequent removal from the palace or house concerned. This is a relic of an ancient difficulty which a statute of 1300 declares to have caused many felonies committed within the Verge to go unpunished. The Royal Court in the thirteenth century moved from one locality to another, if only for the economic reason that, in an age of primitive transport facilities, the King and his followers brought about famine by eating up the produce of the countryside. When a death required investigation the coroner of the King's House ("which" in the words of the statute "never continueth in one place") had no jurisdiction if he remained behind when the King moved on: yet the county coroner had no jurisdiction either. To prevent this deadlock the statute of 1300 arranges for the coöperation of the county coroner with the coroner of the Household. It is perhaps unnecessary to add that the coroner of the King's Household must be distinguished from the King's coroner and attorney. The latter officer used to have jurisdiction over deaths occurring in the King's prisons or in the Rule of the Fleet; but there are now no King's prisons in this sense, and non-franchise coroners investigate prison deaths. When a vacancy occurred in 1892 there was talk of abolishing the office, but Lord Halsbury was not so radical a revolutionary as to acquiesce. The office of King's coroner and attorney was then conferred (without additional salary) upon the Master of the Crown Office, a department of the Central Office of the Supreme Court wherein certain recondite administrative business of the King's Bench Division is transacted. The Master of the Crown Office can be seen in public from time to time when the courts are sitting, for he is ex-officio registrar of the Court of Criminal Appeal.

The Gas Cylinder Case Again

The Court of Appeal last week dismissed the appeal of the dustman's widow in the gas cylinder case. Spent cylinders were given to the dust collector to remove with other refuse from a doctor's house; the dustman who took them away was afterwards found injured by the roadside. The widow's claim against the doctor before Mr. Justice Horridge failed. The judge held that the cylinder was not dangerous in itself, there being apparently no gas left in it. As it was not dangerous there was no negligence in handing it over to the dustman. Mr. Cassels, K.C., for the appellant widow, said he had never contended that the cylinder had burst; his case was that there had been some failure of the article which resulted in the screw cap coming off with great violence so as to cause fatal injuries to the dustman who was handling it. On the appeal Lord Justice Scrutton said that Mr. Justice Horridge's findings were conclusive in the doctor's favour. There was no reason to suppose that extraordinary treatment would be applied to cylinders handed over to dustmen in such circumstances. It looked as if the dustman tried to knock the cylinder cap off, possibly with another cylinder. If that was attempted, all sorts of things might happen which would not be the natural result of the doctor's household giving these things to the dustman to take away.

PARIS

(FROM OUR OWN CORRESPONDENT)

PROFESSIONAL SECRECY

THE imposition of professional secrecy by French law on the medical practitioner sometimes costs him dear. In a letter to *Concours Médical* an anonymous correspondent asks for guidance. Two years ago he attended a young girl for retention of the placenta. Abortion had been induced and sepsis had followed. Both doctor and midwife were implored by the patient never to disclose the cause of her illness to her family. In spite of curetting, repeated once in

hospital, she died of septicæmia. Her brother being her natural heir, a bill was sent him. He refused to pay it on the grounds that he did not understand why his sister had been operated on, and that her doctor had exceeded the limits within which he should have acted. The brother appeared to be totally ignorant of his sister's abortion and the need for operative interference. "May I," writes the doctor, "without violating professional secrecy, tell him the truth? If I do so, may he not bring an action against me for such violation if I take proceedings to secure a settlement?" The legal opinion given by Dr. Boudin on behalf of *Concours Médical* shows a possible way out of the difficulty. The doctor in question might send a copy of his bill to the Sou Médical, a medical defence union, which would communicate with the brother requesting him to settle the account so that the costs of legal action may be avoided and the doctor may be spared the necessity of tarnishing the sister's reputation. Should the brother still prove obdurate, the defence union would either advise the doctor to let the matter drop or would secure the nomination of an expert who, under a vow of silence about what he was told, would inform a law court whether or not the doctor's bill was justified. To avoid similar difficulties in the future, Dr. Boudin advises his colleagues to take their cue from barristers who always insist on payment in advance. Hospitals now require of their poorer patients three weeks' payment in advance, so why not doctors?

GOLD SALTS IN TUBERCULOSIS

At the Laennec Hospital, attached to the service of Prof. Léon Bernard, is the Léon Bourgeois dispensary, where Dr. Charles Mayer gives intravenous injections of gold salts under ambulatory conditions. Women patients attend one morning and men the next. They file past him as he sits by a table on which scores of ready-filled syringes are piled. The patient sits down for a moment, compresses the arm above the elbow with hand or tourniquet, and all is over in less than a minute. The speed with which Dr. Mayer operates is a measure of his dexterity; he misses the vein once, perhaps, in the morning, after he has given over 100 injections and eye and hand are getting tired. These patients attend on an average once a week for two or three years; about half of them are able to remain at work, though most were sputum-positive, and all showed definite X ray and other signs of pulmonary tuberculosis. This treatment is no competitor of sanatorium and artificial pneumothorax; it is designed to meet the needs of those who cannot or will not go to a sanatorium, and who must at all risks stick to their work at home. Dr. Mayer's first publication appeared in 1929 when he claimed arrest of the disease in 43 per cent. of 142 patients thus treated. His controls were 1500 patients not thus treated; hardly 5 per cent. of them were cured. Since then between 700 and 800 patients have been given this treatment. According to his latest returns, 54 per cent. of his earliest 323 cases have benefited. Though the results are of course best in slight and early cases, Dr. Mayer is liberal in his indications; to him even fever is not a contra-indication. The sceptic will be disarmed by a treatment which achieves so large a proportion of its successes among febrile patients with cavities. But it would seem doubtful whether treatment with gold salts offers the sanatorium-treated patient any additional prospect of recovery. At the Sanatorium de Champrosay Dr. H. Nouvion, Dr. (Mlle.) Pauc, and Dr. H. Rotenstein have made comparative radiological studies on 813 patients. Some were given sanatorium treatment alone, others had this treatment supplemented by injections of gold. In 30 cases the X ray picture cleared up under treatment. The distribution of these successes was 3·6 per cent. for the gold cases and 3·7 per cent. for the others.

IRELAND

(FROM OUR OWN CORRESPONDENT)

ECONOMY

THE Temporary Economies Bill (1933) was given a second reading in the Dáil last week. Further study of its text shows that its conditions are more inimical to the interests of the medical profession than would appear from the summary I gave in this column a fortnight ago. Two scales of deduction are applicable to different classes of salaries. In one scale a salary below £300 escapes deduction, in the other only a salary below £210 escapes. In the second class the minimum deduction is higher than in the first. It is into the second (and worse) class that all salaries of medical officers, whether whole-time or part-time, fall. (At first reading of the Bill it appeared as if they fell into the first.) If we take the case of a dispensary medical officer with a salary, including emoluments, of £300 a year, and allowing for the special concession of £50 in the case of dispensary medical officers, he will suffer a deduction of 5 per cent. on £250—namely, £12 10*s*. A medical officer of health, or other whole-time officer with a salary of £800 a year, will suffer a deduction on his entire salary at a cumulative rate, the minimum deduction being £47. A vicious principle in the Bill is that, while the minimum deduction is fixed by scale and is compulsory, the maximum to be enforced lies with the local authority, only subject to the control of the Minister. It is likely that different local authorities will take very varying views as to what is proper. A more vicious principle is that the local authorities are to deal with "each individual case" separately. It is easy to see to what a danger an unpopular officer may be exposed by this provision, and it not infrequently happens that the most popular officer is not the most deserving. In fact, in some branches of the public medical service efficiency tends to diminish popularity.

The debate on the second reading of the Bill has done nothing to lessen surprise that the Government has thought it worth while to introduce the measure. The Minister for Local Government and Public Health, when questioned as to the amount of saving that he hoped to effect, admitted that it would be about £35,000. Contemptible as this gross sum is, it is enough to cause hardship to many a hard-worked local official.

HOSPITAL FINANCE.—The sums given or promised towards the first £100,000 for building the new Westminster Hospital reached £72,579 last Wednesday. The remainder of the money must be raised by the end of March that the governors may fulfil the contract to purchase the new site.—Mr. Stanley Wills has offered to give £10,000 to Bath Royal United Hospitals provided that the balance of £15,000 of the building fund is raised by the end of July.—Mr. Frederick Priestman, who had already given £10,000 to the building fund of Bradford Royal Infirmary, has now added a further £5000 toward the required £150,000, and Bradford corporation has just voted £35,000. The total cost of the new buildings will be half a million, and if they are complete within two years the infirmary will be able to claim a donation of £20,000 which has been promised anonymously.

CORRESPONDENCE

DOCTORS' LETTERS AND HOSPITAL REPLIES

To the Editor of THE LANCET

SIR,—Not long ago you set out (THE LANCET, 1933, ii., 837) an attempt on the part of King Edward's Hospital Fund for London to secure better coöperation between hospital consultants and the practitioners who send patients to see them for opinion or advice. The Fund's out-patient arrangements committee, over the signature of its chairman Sir John Rose Bradford, suggested the adoption of standard forms for doctors' letters and hospital replies. When a practitioner sends a patient up to one of the numerous hospital clinics in London with a note, he usually expects an answer. I suppose that this practice was started by practitioners who were friends of the hospital staff sending up their poorer cases with personal notes. Nowadays a very large number of such cases, not always of the poorer classes, are received from doctors quite unknown to the consultant. These doctors expect an answer in the same way as the consultant's friends would do. Though every endeavour is made by consultants to answer notes from all practitioners there are many ill-understood difficulties in the way of doing this. I believe a ventilation of this difficulty in your columns may make it very much easier for the practitioner to understand the difficulties with which the consultant is faced.

I would further point out that, although many doctors consider themselves aggrieved if they do not receive an answer, there is no obligation whatever on the consultant to reply—except in so far as it may occasionally be of value to the patient. No doubt where the consultant's practitioner friends are concerned, he is indirectly recompensed for his trouble by employment outside the hospital. But in the bulk of the correspondence received to-day he has no such hope of reward. As I shall show, it is, on the contrary, an expense to the consultant. For myself I am often tempted to chuck the whole bunch of rather dirty paper (bar two or three) into the waste-paper basket, with the knowledge that I should be financially in credit over it!

Let me say at once that where a patient is sent up to a special department the remarks that I am going to make do not always apply. For it is often possible for a "specialist"—that is, a physician or surgeon in charge of a "special" department dealing with a small circumscribed type of disease—to give an opinion at once on examining a patient and to answer the letter the same day. This is relatively easy. And it may not be out of place to remark here for the benefit of all and sundry that this is the proper use of the word specialist. A general surgeon or physician is not a specialist most of his time—though often enough he may as well be interested in a "specialty." Further, specialists do not exist by reason of the complexity or difficulty of the diseases or part of the body with which their department deals, but by reason of the amount of clinical material there is to be dealt with in their special line.

But to return to our main thesis. Where a further investigation is necessary on the part of the specialist, and particularly where a patient is sent in to a general physician or surgeon, it must be recognised that it is nearly always impossible to answer the letter immediately. Nearly always some further information of a radiological or laboratory nature is required; or even the opinion of a colleague in charge of a special department may be required before a considered opinion, even on the diagnosis of the case, can be given. It is seldom possible, therefore, to answer a practitioner's letter on the same day as the patient is first seen, but only on some subsequent occasion when the case has been diagnosed and some means of dealing with it according to its necessity has been devised. This depends naturally on the patient putting in the required number of attendances, a condition which is not always fulfilled—often enough because they have been led to believe by the practitioner that he just wants the "opinion" of the hospital doctor. This state of mind "dates" the practitioner badly. For, nowadays in many directions the consultant's "opinion" is, as nearly as he can make it, a certainty. But not without care and investigation.

Again, the facilities for dealing with this correspondence are in many hospitals non-existent. What is the consultant to do with the practitioner's letter? This is often of a confidential nature; but unless it is kept in the patient's notes (which he is at liberty to read—if he can!) it will never again be connected with him. Note cases are usually devised so that letters drop out. Even the arrival of the letter at its proper destination is doubtful by the time it has passed through surgery or casualty departments.

At one of the hospitals of which the writer has the honour to be on the staff, excellent facilities exist in every way. A stenographer is obtainable when required, and the notes are contained in a proper folder which is never in the hands of the patient—who is only given the "treatment card" for the dispensary or elsewhere. So that a letter, however confidential, is never seen by the patient. But one is still dependant on one's out-patient nurse to collect the notes with letters requiring an answer, which onerous task she does, on the whole, well.

At another of the writer's hospitals no facilities whatever exist, and the physician, surgeon, or specialist must depend on noticing the letter (the note cases are of prehistoric design), making a few hurried notes on it and then taking it back to his own secretary. For one cannot interrupt one's clinic to answer letters in one's own hand. He then finds that the practitioner has not mentioned the patient's name or it is quite illegible; as also the doctor's name. The consultant's secretary spends some exceedingly unprofitable time trying to decipher names or to identify the doctor in the directory, only to come to the ultimate conclusion that an assistant or locum has signed the letter. The consultant pays for the stamp himself.

Anyone who has tried to move medical committees in these matters will know the kind of obstruction one is up against. And even the lay house or managing committees are often far from helpful where the provision of paid assistance—e.g., stenographers and typists—is demanded. But if the efficiency of the hospitals and their proper place as consulting centres, which I regard as a very important part of their function, should be developed and maintained, their attention to this question of contact with practitioners is of fundamental importance.

There may have crept into my remarks in the earlier part of this letter a suggestion that the whole thing is a damned nuisance. So it is, under the bad conditions often prevailing. But it ought not

to be. I have written this at some length in the hope that calling attention to it may initiate some necessary improvements.—I am, Sir, yours faithfully,

Jan. 24th, 1934. KARSHISH.

BATTLE OF THE BARBITURATES

To the Editor of THE LANCET

SIR,—There are two questions touched on by Sir Maurice Craig in his letter in your last issue about which something more might be said: the question of addiction and that of the effect of publishing methods of suicide.

(1) *Addiction.*—In the Shorter Oxford Dictionary an addict is defined as "one who is addicted to the habitual and excessive use of a drug." To addict is "to devote or apply habitually to a practice." Obviously these definitions are insufficient, for the use of the word excessive will depend wholly on the private judgment of its user and not on any external standard. There are however two marks by which we can measure whether a given individual is an addict or not. There is euphoria which follows the administration of a sufficient dose of the substance in question. This gradually disappears and is succeeded by craving, which, if the drug be not again administered, becomes more and more severe, until indeed it may become so intolerable that no consideration will stand in the way of the victim obtaining his drug. The drugs of addiction, if this description be correct, are few, morphia, cocaine, and tobacco are probably the only ones with which we need concern ourselves in this country. Alcohol, although it ruins more lives and provides a much more serious practical problem than drug addiction for us, is therefore not strictly a drug of addiction, since it is not difficult to cut an alcoholic off from his means of escape from reality, though it is often exceedingly difficult to prevent him returning to it.

I have administered the barbitones to hundreds of patients, and have seen many others to whom they had been administered. I have never seen any patient who described in himself any sense of well-being after receiving the drug; indeed if the dose is insufficient and he does not sleep, he usually complains that he has had a wretched night, and that he has felt more ill than if he had not taken it. If the drug is omitted there is no feeling of craving; the worst that happens is that he does not sleep. When by other methods sleep has been restored there is no difficulty in getting any patient to drop the barbitones. This is a different story from that which obtains when one is dealing with the real drugs of addiction. As the dose is lowered the misery of the patients is increased; it is clear that in them something is demanding to be neutralised which can only be done by the administration of the drug; and everyone who has tried to treat these patients by progressive withdrawal is aware what a long and terrible business it is for the patient. I think therefore it will be unfortunate if the word addiction is allowed to creep in to describe the merely habitual use of the barbiturates, seeing that their action is obviously so different clinically from that of the true drugs of addiction.

(2) *Publishing methods of suicide.*—There is a real danger here, and I shall be surprised if the effect of the recent press campaign is other than a rise in the death-rate from barbiturates within the next few weeks or months. Besides the patients, to whom Sir Maurice Craig referred, who commit suicide because they seek an escape from the misery of life, there are patients who are morbidly attracted by the idea of suicide, and who are capable of being influenced by the publication of methods. A striking example was communicated to me by a coroner. A man had committed suicide in a bizarre way. He had bored a hole in the landing at the top of the stairs, had run a rope through the hole but prevented it going through altogether by typing a large knot at one end. He brought the other end over the banisters at the landing, made a loop, inserted his head into it and jumped over the banisters. This was published in detail in the local newspaper, and next week another patient repeated the experiment exactly. A few years ago a death from aspirin was reported in the press. The following month a patient in the hospital swallowed 150 grains of aspirin which fortunately only gave him a severe gastro-enteritis. A few months later we had another attempt. Aspirin has, I think, not continued to be a fashionable method, but these two attempts so soon after a published account are significant. In Edinburgh the Dean Bridge, which spans a small river at a height of about 100 feet, became the usual means of suicide in that city to such an extent that the town council were obliged to raise the parapet and make it unclimbable.

If my forecast should prove to be correct, I hope that those who will point out the danger of these drugs will also remember that the rise in the death-rate was preceded by a very active press campaign, and that before this campaign the number of suicides from the barbiturates was negligible.

I have to add that, though I have on three occasions seen patients with ataxia, which was due to prolonged use of large doses of barbiturates, I have never seen any toxic symptoms in anyone where the dose did not exceed 10 grains each night. It may, I think, be stated with confidence that if a patient does not sleep with that dose these drugs are not suitable for him.

I am, Sir, yours faithfully,

T. A. ROSS.

The Cassel Hospital for Functional Nervous Disorders, Penshurst, Kent, Feb. 5th, 1934.

To the Editor of THE LANCET

SIR,—The letter from Sir Maurice Craig brings out very clearly the importance of method in such investigations and of the relative estimation of conflicting evidence. The points at issue were stated in the letter with admirable lucidity and show that the difference of opinion cannot be composed by the mere qualification of a number of general statements, but implies an opposition of views of a completely contradictory type. The propositions put forward in condemnation of the use of the barbiturates are denied by the other side with such a degree of comprehensiveness as to make it evident not only that both cannot be right but that one must be true and the other false.

Sir Maurice Craig has pointed out the misleading nature of the experiments made on animals and says that in his long experience he has never seen a case of pure veronal addiction. The inaccuracies, exposed by Dr. Gillespie, in the figures given of poisoning by the barbiturates and of suicide by this means, indicate further the haphazard methods employed by those who make a case against the use of these drugs. It will be instructive to note what reply, if any, is possible to these criticisms.

Until the question is finally disposed of it is obviously unscientific of one side in the dispute to demand restrictions in the use of these drugs which others find of great value, and all who are interested in the subject will agree with Sir Maurice Craig that the time has come when the evidence for the opposing views—as distinct from mere assertions—should be

brought forward and an attempt made to settle the problem.—I am, Sir, yours faithfully,

FREDERICK DILLON.

Wimpole-street, W., Feb. 5th, 1934.

To the Editor of THE LANCET

SIR,—I think Sir Maurice Craig unjustly minimises the value of our work; there has never been any "error" or "experiments which were fallacious." The work was started by Mott as part of some researches upon degenerations of the nervous system. The mucinoid substance occurring in the body in myxœdema was found by us in the central nervous system of a case; it was then shown to occur in much greater quantity in the nervous system of animals following massive continued doses of several different hypnotic drugs; later it was found by Da Fano in the brains of animals fed upon vitamin-deficient diet; and Buscaino found it regularly in the brains of cases of dementia præcox.

Proof of greatly increased degradation of nervous tissue, such as we have shown to occur in animals with large doses of hypnotic drugs, demands care in the use of even small doses. To deny sleep to a patient in extremis from insomnia is inhuman, but it must be left to the clinician to judge whether the varying degree of degradation of the nervous system is of less importance than the temporary relief of the insomnia, and to give due value to the possible ætiological causes of the symptom.

I am, Sir, yours faithfully,

F. A. PICKWORTH.

City and University of Birmingham, Joint Board of Research for Mental Disease, Feb. 6th, 1934.

To the Editor of THE LANCET

SIR,—Anæsthetists can take heart. A famous toxicologist is stated to have changed his views, for it is freely rumoured that, when asked to give a blessing the other night at a dinner over which he presided, he startled the company by saying "Benedictus barbiturat."

I am, Sir, yours faithfully,

Jan. 27th, 1934. ANÆSTHETIST.

MIGRATION OF A GRÄFENBERG RING

To the Editor of THE LANCET

SIR,—In your issue of Dec. 16th, 1933 (p. 1369), Dr. Margaret Murphy suggests that a silver ring, which had been placed in the uterine cavity for contraceptive purposes, had migrated spontaneously through the wall of the uterus, and made its way by a sort of "pressure-corrosion" into the broad ligament. This suggestion is not in accordance with the experience of myself and other observers in several thousand cases. No such occurrence has ever been observed. Nor is it possible, from the anatomy of the parts, to explain how a smooth flexible ring could perforate the wall of the uterus and migrate into the parametrium.

On the other hand, from Dr. Murphy's own description of the case, we learn that on the last occasion when a ring was introduced the patient herself noted that the "ring was put very high up," and that after its insertion she had pain in the lower part of the back, chiefly on the right side, and difficulty in walking for about a week. Is it not more probable that the surgeon had made with a Hegar's dilator a false passage and that the ring was pushed through the opening into the parametrium? Naturally the ring, being in the parametrium, exerted no contraceptive effect on the interior of the uterus, and within about seven weeks a normal pregnancy began.

One lesson from this case is that even when the ring was misapplied no dangerous disturbance followed.—I am, Sir, yours faithfully,

Berlin, Jan. 5th, 1934. DR. ERNST GRÄFENBERG.

MUCOUS COLITIS

To the Editor of THE LANCET

SIR,—Does Dr. Hales seriously mean that when a patient has "rectal pyrexia of between 99° and 100° F. after half an hour's rest" we should suspect mucous colitis, in spite of the fact that he has never passed any mucus in his life? He states that the diagnosis is confirmed when "very long dense masses of mucus" are discovered "after colonic lavage has been continued for a considerable period." The truth is that the healthy mucous membrane can stand a good deal of injury by unnecessary lavage before it finds it necessary to protect itself from further rough handling by the secretion of long dense masses of mucus. Dr. Hales should examine a patient with the X rays during the administration of an opaque enema. He would find that a pint and a half of fluid is always sufficient to reach the cæcum, a fact which has been familiar to radiologists for at least 25 years. I am in entire agreement with Dr. Geoffrey Holmes that if intestinal lavage is employed at all, not more than two pints should be given at a time. The use of four or five pints by Dr. Hales is a return to the bad practice of 30 years ago, which led Mathieu to say that he had seen far more cases of mucous colitis produced at Plombières than ever went there for treatment.

I am, Sir, yours faithfully,

New Lodge Clinic, Feb. 3rd, 1934. ARTHUR F. HURST.

To the Editor of THE LANCET

SIR,—During the discussion at the Royal Society of Medicine on Jan. 19th several speakers referred to the treatment of mucous colitis at the spas and elsewhere by colonic irrigation. Dr. Holmes described in detail the method employed at Harrogate, but neither he nor any other speaker said anything about the qualifications of those responsible for its administration—regarding that, no doubt, as outside the province of that meeting. It would be of interest to other workers to know precisely what amount of training is expected on the part of those who carry out the treatment. Are they State-registered nurses, members of the Chartered Society of Massage and Medical Gymnastics, or bath assistants who have acquired a knowledge of the correct procedure by constant practice?

I am, Sir, yours faithfully,

London, W., Feb. 1st, 1934. M. B. RAY.

ISCHÆMIC NEPHRITIS

To the Editor of THE LANCET

SIR,—The report of my introduction to the discussion on The Factors Influencing Renal Function which took place at the Royal Society of Medicine on Jan. 25th contains an inexactitude which calls for correction.

Your reporter states that I applied the term "ischæmic nephritis" to the whole of "Bright's disease." Actually I was at pains to point out that amongst that huge group which is included in the term "Bright's disease" is a very definite sub-group due to progressive arterial degeneration rather than

to the effects of bacteria or their toxins, and characterised by hypertension in life and circulatory changes in many organs outside the kidney after death. To this group pathologists and physicians now attach the name of "ischæmic nephritis" and the first point of my communication was to stress the importance of observations of the blood pressure in order that cases belonging to this group might not escape detection.

I am, Sir, yours faithfully,

Harley-street, W., Feb. 3rd, 1934. T. IZOD BENNETT.

DIPHTHERIA IMMUNITY AMONG ISOLATED RACES

To the Editor of THE LANCET

SIR,—With reference to your leading article last week on this subject attention may be directed to another recent survey of an isolated race carried out by Dr. M. Khalil Bey for the Egyptian public health department (Cairo: Government Press, 1933). This was in the oasis of Siwa, which is situated in the western desert, 300 kilometres from any inhabited place of cosmopolitan character—well isolated, therefore, though not perhaps to the extent that was formerly the case. The population in 1927 numbered 3795, of whom 922 were children less than 15 years of age. The Schick test was applied to 123 boys under 15 years of age, of whom 24 were positive: of 58 boys aged 2–5 years, 20 (or 35 per cent.) were positive; of 65 boys 5–13 years, 4 (or 6 per cent.) were positive. That is to say, the susceptibility to diphtheria, judged by the Schick test, is similar to that found in any city. There are no records of diphtheria having occurred in the oasis, but it would not be safe, of course, to depend on this, and there were no facilities for a bacteriological survey of the population.

I am, Sir, yours faithfully,

R. TANNER HEWLETT.

Seaman's Hospital, Greenwich, Feb. 5th, 1934.

THERAPEUTIC PYREXIA

To the Editor of THE LANCET

SIR,—The letter from Dr. Le Bas in your issue of Jan. 27th (p. 214) has interested me very much as I have been working on this subject for the past two years. The preliminary experiments carried out in the physics department of Armstrong College have already been described.[1] The work has since been carried on under the auspices of the Medical Research Council. The apparatus has been much improved and is being used for the treatment of G.P.I. at the Newcastle General Hospital. The clinical results are highly satisfactory but they are not yet felt to be sufficiently extensive to justify publication.

I am, Sir, yours faithfully,

S. F. EVANS, M.Sc.

Newcastle General Hospital, Feb. 5th, 1934.

[1] The Use of High Frequency Electric Fields to Raise Body Temperature. By W. E. Curtis and S. F. Evans. Proc. Univ. Durham Philos. Soc., vol. ix., Part 2, p. 61.

PUBLIC HEALTH

Preventive Treatment of Adolescents in London

A YEAR ago Mr. Somerville Hastings and Miss E. Rickards, F.R.C.S., brought before the London county council the desirability of providing preventive and curative treatment for young people between the ages of 14 and 16 years. There is, as Sir George Newman pointed out seven years ago in "The Health of the School Child," a breakdown in the medical service when the boy or girl leaves school. The adolescent is no one's care and the majority are not even covered by welfare schemes although urgently needing continued education in matters of health. The L.C.C. central public health committee is advised that the position in regard to welfare schemes is now worse than it was then. By the Education Act of 1921 young persons above the age of 14 attending secondary and day classes in London are entitled to the benefit of the L.C.C. school medical service, but there is to-day nothing of the kind in connexion with the voluntary day continuation classes or the evening institutes. On Tuesday last the L.C.C. endorsed the recommendation of its public health committee that for an experimental year arrangements should be made for the inspection and treatment of students attending all the day continuation classes and three of the evening institutes. Inspection is to take place between three and six months after admission. The school medical records of the children are to be available, the students are to be informed that inspection is voluntary, and parents invited to attend. It is believed that 75 per cent. of the scholars will agree, making about 4000 in all to examine. Little extra cost would, it is said, be incurred on account of the daytime treatment, since most of the committees undertaking this work are now paid on a block-grant basis.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 27th, 1934

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 9 (last week 7); scarlet fever, 3436; diphtheria, 1400; enteric fever, 17; acute pneumonia (primary or influenzal), 1330; puerperal fever, 54; puerperal pyrexia, 132; cerebro-spinal fever, 25; acute poliomyelitis, 4; acute polio-encephalitis, 2; encephalitis lethargica, 8; dysentery, 28; ophthalmia neonatorum, 83. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 30th–31st was as follows: Small-pox, 24 (last week 21); scarlet fever, 2215; diphtheria, 2071; enteric fever, 7; measles, 1237; whooping-cough, 274; puerperal fever, 28 mothers (plus 9 babies); encephalitis lethargica, 260; poliomyelitis, 5; "other diseases," 193. At St. Margaret's Hospital there were 19 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 59 (21) from measles, 15 (4) from scarlet fever, 24 (8) from whooping-cough, 60 (8) from dysentery, 37 (9) from diarrhœa and enteritis under two years, and 67 (20) from influenza. The figures in parentheses are those for London itself.

The deaths from influenza during the past few weeks (working backwards) have been as follows: 67, 87, 100, 109, 83, 97, 95, 70, 59. The 363 deaths during the first four weeks of the year compare with 5230 deaths for the corresponding weeks of 1933. Nine deaths were this week attributed to influenza at Birmingham, 5 at Glasgow, 3 each at Walthamstow, Oldham, and Stoke-on-Trent; no more than two in any other great town. Seven fatal cases of measles occurred at Liverpool, 6 each at Leeds and Manchester. Manchester reported 3 deaths from scarlet fever. Of the fatal cases of diphtheria 8 occurred at Liverpool, 5 at Huddersfield, 4 each at East Ham, Manchester, and Birmingham.

The number of stillbirths notified during the week was 274 (corresponding to a rate of 44 per 1000 total births), including 38 in London.

PANEL AND CONTRACT PRACTICE

SCOTTISH SICKNESS EXPERIENCE

THE Department of Health for Scotland has recently issued its third study of the sickness incidence amongst insured persons (H.M. Stationery Office, 1934, pp. 40, 9*d*.) and proposes to continue the series annually in similar form so that the trend of certified sickness may be followed not only as a whole but in relation to such factors as age, sex, cause, and location. The present report analyses, for the whole insured population of Scotland, all cases of incapacity which terminated in the year ended June 30th, 1932. No very marked divergence from the statistics for the previous year is to be observed.

SEX DISTRIBUTION OF IMPROVEMENT

There was a slight fall of 2·1 per cent. in the total days of sickness suffered, and a similar small drop was recorded, amounting to 5 per cent., in the number of completed cases of incapacity. As a corollary the average duration of incapacity increased by 3·1 per cent. The improvement in total duration and number of cases was derived entirely from the male experience, females showing a slight rise in both characteristics. Taken as a whole the incapacities recorded during the year are equivalent to just over 20 cases per cent. of the insured population, with an average loss of 9·44 days per person insured. The most important contributions to the decline in sickness in this year are made by respiratory diseases, accidents, skin conditions, gastritis, and anæmia, while increases are recorded in the number of incapacities ascribed to tuberculosis, malignant tumours, heart disease, gastric and duodenal ulcer, appendicitis, hernia, and kidney disease. The numerically heaviest causes of sickness remain the diseases of the respiratory tract (with influenza, bronchitis, and tonsillitis as the prominent diagnoses), diseases of the organs of locomotion (principally the acute and chronic rheumatic conditions), diseases of the digestive system, and accidents. Analysis by age shows, somewhat surprisingly, that there is very little variation in the *number of claims* at ages under 55 years; it is not till the last ten years of insured life that there is an appreciable increase. On the other hand the *days of sickness* per person increase progressively from the earliest to the latest age-periods. Thus in males the days of incapacity for persons under 20 years of age is only about half the general average, whereas in males of 55–59 years and of 60–64 years they are one and a half and four times respectively as high as the general average. Comparison of the sexes shows that the higher incidence on single women compared with men is found to be predominantly a feature of the three earliest quinquennial groups of industrial age. Amongst married women an excessive incidence is, however, a feature of every age-group, though declining fairly constantly as age increases. In fact among young married women of less than 20 years the incidence rate is equivalent to an average of more than one completed incapacity per person per annum, and the days of sickness suffered per person are materially higher at these ages than at any other age under 60. Regional comparisons of the sickness experience show that the incidence of incapacity (number of cases) is highest in the industrial belt, lowest in the north and north-east, with the border districts intermediate. The average durations of illness are in the reverse order, while days of sickness per person show only small discrepancies.

A GROWING RECORD OF MORBIDITY

The detailed figures in the appendix raise many interesting points. For example it may be calculated that the average duration of absence from work is 54 days per case of scarlet fever and 52 days per case of diphtheria. These periods seem surprisingly long; it is difficult, too, to see why single women should on the average take 11 days longer than men to recover from diphtheria, while their excess for scarlet fever is but four days. The high incidence of such "causes" as anæmia (mainly among females) and gastritis, which shows an average duration of roughly five weeks per case, reveals the weakness of some of the foundations upon which the statistician must at present build. But there is little doubt that this annual analysis of the records will in due course react upon the recorders and lead to more accurate certification. The Department has begun on carefully planned and sound lines, and within a relatively short space of time it may reasonably be hoped that Scotland will be in possession of statistics of morbidity as valuable in their own field as the statistics of mortality.

Careless Dispensing

Two chemists were recently discussing the dispensing of insurance prescriptions; A said to B "How do you manage to make up these prescriptions when they come in?" B replied "Well, you see, I keep a fair stock of drugs and medicaments. I do not often have to send up to town for anything I want." "Oh" said A, "anybody can make up the prescription when they have the drugs in stock; my difficulty is to make them up when I have not got them in stock." The story may be apocryphal but it seems to be true that in London one prescription in every seven is incorrectly dispensed. The scheme for testing drugs and appliances supplied to insured persons was drawn up for the London insurance committee by two of its subcommittees and with the approval of the Ministry of Health came into operation towards the end of 1925. Since 1927 the pharmaceutical service subcommittee has been required by the Ministry to make 449 tests each year, 363 of drugs and 86 of appliances. After a test has been taken the certificate received from the analysts is submitted to the chairman of the subcommittee and one of its pharmaceutical members. If the certificate shows that a satisfactory result has been obtained it is passed. If on the other hand the certificate appears to the examining members to indicate that there has been such a degree of error as to justify a hearing, the matter is referred to the subcommittee for investigation. A written explanation is sought from the chemist. He is invited to appear before the subcommittee when the whole circumstances of the matter are thoroughly explored with him. The subcommittee then makes recommendations to the main committee. During the last four years the number of references to the committee have been as follows:—

	Cases referred.	Percentage of the whole number.
1930..	96	21·4
1931..	81	18·0
1932..	72	16·0
1933..	69	15·4

The subcommittee regards with satisfaction this progressive improvement, and is of opinion that an increase in the number of tests would not make for an

improved service. But Mr. J. S. Fowler (representative of the L.C.C. on the insurance committee), in commenting on these figures, pointed out that improvement in 1933 over 1932 was minimal, that 15·4 per cent. was roughly 1 in 7, or in other words of all the prescriptions and appliances tested one in every seven was wrong. As there were approximately 8,000,000 prescriptions issued in London every year this meant that about 1,000,000 of them were improperly dispensed. He thought 449 was much too small a number of tests to make and he regarded the whole position as highly unsatisfactory. A medical member asked if the scheme was worked by areas and whether firms who were known to be apt to make mistakes were particularly selected. No reply was given to this question which was ruled out of order as against public policy, the meeting being open to the public. Yet the treatment of an insured person does in part depend on his being supplied with the drugs prescribed for him.

Chemists' Hours

In most foreign countries the chemist is on a somewhat higher professional status than in this country. There doctors hardly ever dispense and chemists never prescribe. The chemist's office or place of business is often a private house and he does very little else except make up medicines. In this he is protected by law, for, to take Italy as an example, except for the sale of quinine which is a State monopoly and is sold (as postage stamps are) by the tobacconist, it is almost impossible to obtain any medicament other than at a pharmacy. As a result of this he is only allowed to close as a concession. In Czechoslovakia, Finland, Hungary and Sweden the law of the land states definitely that the pharmacist must keep his dispensary open day and night and may only close with permission of the prefect of police or some other competent authority. In most countries all pharmacies, at least in larger towns, are open on Sunday until about 1 P.M. In Germany Sunday closing is controlled by administrative officers of the different States, provision being made everywhere for urgent cases at all times. In Austria the arrangements are similar. In Belgium purely voluntary systems assure a sufficient "guard" duty. In Holland the Ministry of Health inspector gives authority to close. In France, Switzerland and Jugoslavia agreements are made between the chemists and the local authorities. In America there is no federal law on closing, but the State of Maryland opposes the fixing of hours on the ground that the pharmacist must in the interest of public health give his services "during long days of 14 to 16 hours for seven days a week." It will be seen that the British pharmacist enjoys a privileged position.

Consent Unreasonably Withheld

A principal in an insurance practice is not allowed to have more than 2500 insured persons on his list according to the allocation scheme. If his list increases beyond this number, he must either discard some names, which he can select, until the list is reduced to the proper number, or he can apply to the insurance committee for his area for permission to employ an assistant, or he can take another practitioner into partnership. A doctor in the Birmingham area recently applied for leave to employ an assistant, consent was given by the medical benefit subcommittee, and the assistant was placed on the insurance committee's list. When however the subcommittee was informed that the assistant would (*a*) attend surgery every morning 10–11 A.M. and every evening 6–7.30 P.M. (except Fridays), (*b*) attend a course of post-graduate study at the university from 2–6 P.M., and (*c*) sleep at his residence (a distance of about six and a half miles away from the surgery) they decided the applicant was not an assistant acting upon a whole-time basis. The assistant then withdrew his name and the practitioner reduced his list to bring it within the limit fixed by the allocation scheme. If these facts are correctly reported it seems that the Birmingham committee must have overlooked the fact that there is nothing in the regulations to say that an assistant must be whole-time. From the particulars given above it seems that the suggested hours on duty included all the morning and most of the evening; that although some distance away, he was available at night; and that in the afternoon he was doing work which should render him more efficient in practice. The regulations say that permission must not be unreasonably withheld. Surely it is unreasonable to withhold permission on the ground stated, for if one doctor can look after 2500 persons, two can certainly look after 3000 even if one is not available for four hours in the afternoon. And in any case the principal is responsible for adequate attention. The regulations also do not allow an insurance committee to refuse permission without consulting the panel committee.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Lt. C. P. Collins is appointed to *Victory* for R.N.B.

ROYAL ARMY MEDICAL CORPS

The undermentioned Lts. to be Capts.: J. B. George, J. T. Robinson, and M. A. Rea.

ARMY RESERVE OF OFFICERS

Lt.-Col. C. F. White, having attained the age limit of liability to recall, ceases to belong to the Res. of Offrs.

TERRITORIAL ARMY

Lt.-Col. H. E. McCready to be Bt.-Col., retires on completion of tenure and retains his rank, with permission to wear the prescribed uniform.

Capt. and Bt. Maj. J. S. M. Connell to be Lt.-Col. and to comd. 143rd (S. Midland) Fd. Amb.

Lt. T. A. Danby to be Capt.

2nd Lt. N. McLeod, late Border R., to be Lt.

INDIAN MEDICAL SERVICE

Capt. T. A. Doran to be Maj.

Capt. B. Shanker relinquishes his temp. commn.

ROYAL AIR FORCE

Air Commodore H. V. Wells is placed on the retd. list and relinquishes his appointment as Honorary Physician to the King.

Flight Lt. E. Corner is transferred to the Reserve, Class D (ii).

NEW HOSPITAL AT ST. HELIER, SURREY.—The Surrey county council has decided to build in this new town a hospital of 800 beds and 50 tuberculosis beds at a cost, for the building alone, estimated at not less than half a million.

BLACK NOTLEY SANATORIUM.—The Essex county council has decided to enlarge this sanatorium at a cost of £63,000 to accommodate 300 patients. Originally the sanatorium was built for the reception of 150 women and children, but the number has since been extended to 164, and temporary wooden buildings will take 24 non-pulmonary adult male cases. These buildings are now to be removed, and the additional accommodation will provide for the treatment of pulmonary and non-pulmonary tuberculosis in women and children, and for about 40 cases of male non-pulmonary tuberculosis.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Employers' Liability

IN the House of Commons on Feb. 2nd Mr. H. WILLIAMS moved the second reading of the Employers' Liability Bill. Mr. THORP, who seconded, said that the subject matter of the measure was the old Common Law doctrine that if a workman in the employ of a person was injured by reason of the negligence of someone who was in the same employment then the employer of the negligent person was not liable for damages to the workman injured. This old doctrine had never applied in any country except England. Whatever might have been the origin of it, this rule of law was a distinct hardship, and it was only proper that it should be altered.

Mr. JOHN said that the Opposition heartily supported the Bill which as far as it went would ensure improved facilities and better protection for injured workers and their dependents. The risk of accidents arising out of negligence on the part of fellow-workers was much greater to-day than in past years and had a tendency to increase.

Sir D. SOMERVELL, Solicitor-General, said that if the Bill were passed it was likely to raise again the old controversy as to employers contracting out. Parliament having in the Employers Liability Act of 1880 and the Workmen's Compensation Act imposed on employers liabilities quite unknown to the Common Law, the House ought to consider whether there was not some inconsistency between now going back to the other solution and putting extended liabilities on employers and at the same time imposing on them the statutory liability for negligence or no negligence. In cases where workers were injured it was surely desirable that the matter should, if possible, be settled without litigation or controversy. While the Government would allow a free vote on the second reading of the Bill they thought it right that the House should keep in mind the points had raised before action was taken.

The Bill was read a second time.

Divorce Law Reform

Mr. H. KNIGHT moved the second reading of the Matrimonial Causes Bill. He said that a review of the divorce law of this country should be undertaken by a responsible Government. Unfortunately, however, no responsible Government was in sight, so far as he could see, which would undertake that task. In 1912 a Royal Commission sat for two years and considered the question and finally, by a majority of nine to three, recommended Parliament to carry out the proposals contained in this Bill. Since then the proposals had been approved on three occasions by the House of Lords. The Bill proposed that petitions for divorce should be on the following grounds: first, that the respondent had committed adultery; second, had deserted the petitioner for a period of at least three years; third, had since the marriage treated the petitioner with cruelty; fourth, was incurably insane, and had been continuously a certified lunatic for at least five years immediately preceding the petition; fifth, was an incurable habitual drunkard, and had for a period of at least three years been separated from the petitioner in consequence of habitual drunkenness; and sixth, was undergoing imprisonment under a commuted death sentence. It was provided that the court must give the closest possible scrutiny to the facts relied on in the petition. The Bill also provided that the defence to these grounds of petition should be: first, that the petition was the result of collusion between the parties; second, that where the petition was on the ground of adultery the petitioner had been an accessory to or connived at or condoned the adultery; third, where the petition was presented on the ground of cruelty, that the petitioner had condoned the cruelty; and fourth, where the petition was on the ground of insanity or habitual drunkenness, that the petitioner had been guilty of such wilful neglect and misconduct as had conduced to to the insanity or habitual drunkenness.

Sir ARNOLD WILSON seconded the motion for the second reading.

REJECTION MOVED

Dr. O'DONOVAN, in moving the rejection of the Bill, said that if it were the case, as had been said, that "faked" adultery was common in the cases in the divource-courts, that was not a reason for entrusting the courts with more power, but for restricting their power. He considered that desertion was one of the most easily arranged causes of collusive divorce. This country would be reduced to a very bad way indeed when the contract and status of marriage, which was governed by the words of the marriage service, was reduced to a registered concubinage that could be destroyed on a plea of desertion for three years. Cruelty was a term difficult to define. If it was left to the interpretation of His Majesty's judges it was almost inescapable that mental cruelty would be interpreted under that head and they knew what mental cruelty might be. It might be a long continued torture, but it might also be the imaginings of a neuropath. Unfortunately to-day there was too much consideration given in the Press and in books to the sex question, and doctors were besieged in their consulting rooms by spouses who were of the opinion that they were suffering from marital, sexual disabilities, and disharmonies. In the mind of a neuropath any act of the other partner might be interpreted as mental cruelty.

Sir J. WITHERS said the term "cruelty" had been a ground for separation for years. The judges had laid down that there must be some physical result from the cruelty, and it had nothing to do with mental cruelty at all.

Dr. O'DONOVAN said he accepted that valuable interruption, but physical results from mental cruelty could be produced by any competent physician after three minutes' observation and listening to the patient. If insanity for five years was sufficient ground for divorce he could not understand why the mover of this Bill had not added physical incapacity for any cause whatever. He (Dr. O'Donovan) could name a number of incurable diseases, paralytic diseases, rheumatic diseases, unpleasant and revolting diseases, which would last for many years and which had caused husbands to live apart from their wives, and if Mr. Knight was moved by compassion, why had he put his finger only on the incurably insane? The Royal Commission noted that those who had the care of the insane were quite certain that a provision in the law of this kind would have a bad effect on their patients. The incurably insane were not incurable in the first five years. This Bill would be a blow to the cure of the insane and an added mental torture to them unless they were in a condition of complete amentia. Members of the medical profession had great difficulty in defining what drunkenness was. The incurable drunkard was hard to find and he would find it difficult to give sworn evidence that any drunkard was incurable.

BILL TALKED OUT

Dr. O'DONOVAN was still speaking when, under the rules of the House, the debate was automatically adjourned.

HOUSE OF COMMONS

WEDNESDAY, JAN 31ST

Meals Supplied to School-children

Mr. PRICE asked the Parliamentary Secretary to the Board of Education the number and percentage of school meals provided free and for payment, respectively, during 1933; and the number of children fed by county councils, county borough councils, borough councils, and urban district councils, giving each separately.—Mr. HERWALD RAMSBOTHAM replied: The answer is as follows: Information regarding the number and percentage of school

meals provided free and for payment during the calendar year 1933 is given in Table I. below. Particulars of the number of children fed can only be given for the last financial year or for a single month. As the returns for the financial year 1932-33 are now rather out of date, the latest available monthly figures—i.e., for December, 1933, are given in Table II.

TABLE I.—*Number of Meals provided by Local Education Authorities during the Calendar Year*, 1933

England and Wales.	Free.	For payment.	Total.	Percentage free.	Percentage for payment.
Counties (excluding London)	17,076,225	6,242,867	23,319,092	73·2	26·8
London	3,639,207	2,983,869	6,623,076	54·9	45·1
County boroughs	23,342,715	3,226,226	26,568,941	87·9	12·1
Boroughs	3,919,260	387,270	4,306,530	91·0	9·0
Urban districts..	6,207,846	220,547	6,428,393	96·6	3·4
Totals ..	54,185,253	13,060,779	67,246,032	80·6	19·4

TABLE II.—*Number of Children Fed during the Month of December*, 1933

England and Wales.	Free.	For payment.	Total.
Counties (excluding London)	61,753	36,653	98,406
London	19,931	16,899	36,830
County Boroughs	81,732	19,348	101,080
Boroughs	18,469	3,944	22,413
Urban Districts	17,908	1,281	19,189
Totals	199,793	78,125	277,918

Import Duty on Insulin

Mr. LECKIE asked the President of the Board of Trade whether he would repeal or reduce the import duty on insulin.—Mr. COLVILLE (Secretary to the Overseas Trade Department) replied: The position with regard to prices of insulin is being closely watched. My hon. friend is no doubt aware that the price of foreign insulin has not increased and that the price of British insulin has recently been reduced.

Mr. DAVID GRENFELL asked the Minister of Health (1) the price of British and imported insulin, and whether he could give an estimate of the additional cost to the hospitals of this country due to the 33⅓ per cent. tax upon imported insulin; and (2) the quantities of British and foreign insulin, respectively, sold in the United Kingdom in 1933, with the price per 100 units, wholesale and retail.—Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) replied: Throughout 1933 the price per 100 units to the consumer of two of the three brands of British insulin was 2*s.*, of the third 1*s.* 8*d.*, and principal imported brand 1*s.* 5*d.* My right hon. friend has no information as to the quantities sold. On Jan. 11th, 1934, the price of two British brands was reduced to 1*s.* 10*d.* and of the third to 1*s.* 5*d.*, with corresponding reductions in wholesale prices. There has been no change in the price of imported insulin since the additional import duty was imposed.

The Death Penalty

Mr. VYVYAN ADAMS asked the Home Secretary how many executions had occurred in England and Wales since the Select Committee in 1930 reported in favour of the abolition of the death penalty for an experimental period of five years; and how many of the offenders so executed were of the male sex.—Sir JOHN GILMOUR replied: The number is 29, all males.

THURSDAY, FEB. 1ST

Noisy Road Vehicles

Mr. MCENTEE asked the Home Secretary the number of prosecutions during 1933 with regard to noisy road vehicles; and whether, in view of the increasing noise of certain types of vehicles, it was proposed to issue any new orders to secure an abatement of this nuisance.—Sir JOHN GILMOUR replied: Preliminary figures show that during 1933 in England and Wales 9653 noise offences of all classes in connexion with motor vehicles were dealt with by prosecution. My hon. friend the Minister of Transport has already consulted me on the matter and is, I understand, taking it up with the manufacturers.

Factory Legislation

Mr. RHYS DAVIES asked the Home Secretary whether it was proposed to introduce during the present session a Bill for the consolidation and amendment of the laws relating to factories.—Sir J. GILMOUR replied: I regret that I see no prospect of such legislation this session.

Mr. DAVIES: In view of the great necessity for consolidating these Acts of Parliament will not the right hon. gentleman reconsider his decision, at any rate, so far as consolidation is concerned.

Sir J. GILMOUR: The Department's point of view no doubt is that they would be very glad to have such a Bill, but Parliamentary time is fully occupied.

Hours of Work of Young Persons

Viscountess ASTOR asked the Home Secretary whether it was proposed to introduce legislation on the lines of the recommendations of the Select Committee on Shop Assistants, or of that unanimous part of their recommendations relating to the limitation of hours of work of young persons.—Sir J. GILMOUR replied: The Bill promised in the King's Speech to regulate the hours of employment of young persons in the distributive trades is now being finally considered, and I hope that it will be possible to introduce it at an early date.

Viscountess ASTOR asked the Home Secretary whether it was the intention of the Government to bring before Parliament at an early date a resolution authorising local authorities to make by-laws relating to the hours and conditions of employment of juveniles.—Sir J. GILMOUR replied: As I have informed the noble lady on previous occasions, it is not the intention of the Government to take any steps to bring into operation Section 19 of the Children and Young Persons Act, 1933.

Viscountess ASTOR: The Government promised during the passage of the Children's Bill that they would bring in a Bill to regulate the hours of work of children in unregulated trades.

Sir J. GILMOUR: That promise was no doubt given, but it was qualified with the statement "when the industrial situation improves."

Viscountess ASTOR: Does the right hon. gentleman really think that the House of Commons wants children penalised by long hours because of the industrial situation?

Death from Asphyxia on "Dunbar Castle"

Capt. ERSKINE-BOLST asked the Home Secretary what action, if any, he proposed to take in regard to the death of William McDonald, of Limehouse, due to asphyxia after being in charge of operations with an oxy-acetylene super-warmer on the Dunbar Castle (see THE LANCET, Feb. 3rd, p. 259); and if any other cases of a similar nature had been brought to his notice.—Sir JOHN GILMOUR replied: The operation was of a very unusual character and no similar case appears to have come to the notice of the Home Office. It is proposed to publish in the series of notes on industrial accidents, which has a wide circulation among firms likely to be affected, an account of this case, drawing attention to the danger now revealed and the necessary precautions. I will consider whether any other action is called for.

Blood Test for Alcoholism

Capt. ERSKINE-BOLST asked the Home Secretary whether his attention had been called to the new blood-test system for alcoholism; and whether the Home Office would consider its adoption.—Sir JOHN GILMOUR replied: I am aware of the test to which my hon. friend refers. I presume that he has in mind its adoption in cases where drunkenness is an element in a criminal charge; but I doubt its value for such a purpose, and I have no power to require any person to submit to it.

Sale of Barbituric Drugs

Dr. HOWITT asked the Home Secretary whether his attention had been drawn to the fact that the retail

sale of drugs of the barbituric group was permitted without restriction; whether he had made inquiries as to the situation; and what action he proposed to take in the matter.—Sir J. GILMOUR replied: These drugs are included in Part I. of the present Poisons Schedule and are therefore subject to the full restrictions imposed by the Pharmacy Act, 1868, upon the sale of poisons. The question whether any further restrictions are desirable will be considered by the Poisons Board recently established under the Pharmacy and Poisons Act, 1933.

Mr. D. GRENFELL: Is there any system of inspection? Has the Department any officers to see that these Acts are properly administered; and is the right hon. gentleman not aware that there are wholesale complaints against the easy way in which these drugs can be obtained?

Sir J. GILMOUR: The law makes certain provisions. As I have said, the new advisory body which has been set up will investigate whether further steps are required.

Sir F. FREMANTLE: Can my right hon. friend say how soon we shall get some report from the Poisons Board? Shall we have to wait for an annual report, say 15 months hence, or shall we have an early report on this, which is a very disturbing feature of the present situation?

Sir J. GILMOUR: I should like notice of that question.

Supply of Water in Bulk

Sir WILLIAM DAVISON asked the Minister of Health whether provision would be made in the Bill, shortly to be introduced, dealing with grants for water-supply in rural areas, to enable local authorities and statutory water companies which had a surplus of water within their areas, to supply water in bulk to other areas beyond their authorised limits of supply, with the approval of the Ministry of Health.—Sir HILTON YOUNG replied: No, Sir. It is considered desirable to limit the scope of the proposed Bill to the authorisation of grant and not to deal therein with amendments of the general law. A local authority has power now to purchase water from an adjoining local authority.

Mr. DAVID GRENFELL asked the Minister of Health the number of rural local authorities which had submitted requests for financial assistance to provide local water-supplies; and whether he had estimated the aggregate cost of regional or local schemes to provide an adequate supply for every local authority in England and Wales.—Sir HILTON YOUNG replied: Seventy rural local authorities have made inquiries as to the availability of grant. As regards the second part of the question, such an estimate could not be made except in presence of full information as to the cost of schemes.

Mr. GRENFELL: Is there not sufficient evidence to warrant the Minister giving much more substantial encouragement so that, if necessary, a large instalment of the programme can be put into effect this year?

Sir HILTON YOUNG: No, Sir. I have good reason to suppose that the proposed grants will enable us to get useful work done.

Housing and Slum Clearance

Mr. CRAVEN-ELLIS asked the Minister of Health for particulars of cases where private enterprise had failed to provide houses and, in consequence, the local authority had exercised its duty to provide the houses required.—Sir HILTON YOUNG replied: Since May last, when the Housing (Financial Provisions) Act, 1933, became law, approval has been given to the erection of houses without subsidy to 53 local authorities. These proposals comprise 1698 houses and before approval was given the authorities concerned satisfied me that there was no likelihood of the houses being provided by private enterprise.

Mr. CHORLTON asked the Minister of Health if he would introduce legislation at an early date to deal with the question of adequate compensation for small shopkeepers dispossessed and losing goodwill in any slum-clearance area.—Sir HILTON YOUNG replied: No, Sir. Section 41 of the Housing Act, 1930, confers on local authorities the power of paying allowances in the circumstances mentioned, and I understand this power to be generally used to meet any substantial case of hardship.

Major NATHAN asked the Minister of Health whether he had any particulars as to the number of underground rooms habitually used as sleeping places in the administrative county of London that were unfit for human habitation within the meaning of Section 18 of the Housing Act, 1925.—Sir HILTON YOUNG replied: No full estimate of the present position is available, but I am asking the London County Council to make inquiries and will communicate with the hon. Member as soon as practicable.

Conditions in Hopfields

Mr. ALAN TODD asked the Minister of Health (1) if he would give the names of the farms complained of in the report of the Staffordshire County Council's Education Committee on the conditions in the hopfields in Herefordshire and Worcestershire; (2) what steps he proposed to take to render conditions in the hopfields of Worcestershire and Herefordshire such that the Staffordshire Education Committee might make the school holiday period coincide with the hop-picking season so that children from South Staffordshire might, without injury to their health and morals, be allowed to take their holidays in the hopfields; and (3) and what steps he proposed to take whereby conditions in these hopfields might be made suitable for hop-pickers and their families.—Sir HILTON YOUNG replied: I have seen the report in question and I am communicating with the Staffordshire County Council in regard to the names of the farms complained of which have not yet been disclosed. The responsibility for supervising the accommodation provided for hop-pickers rests with the local sanitary authorities, but my officers inspect the more important hop-growing areas from time to time and any serious defect in the arrangements made for hop-pickers is brought to the attention of the local authority responsible for the matter.

Panel Practitioners' Remuneration

Mr. RHYS DAVIES asked the Minister of Health what answer had been returned to representations from any section of the medical profession for the restoration of the 1*s.* per insured patient per annum taken from panel doctors in the autumn of 1931.—Sir HILTON YOUNG replied: My answer has been that the 10 per cent. deduction made from the remuneration of insurance practitioners in 1931 was part of the Government's general scheme of economy covering the whole field of public expenditure; and that any question of restoring the cuts must be considered as a whole.

Import of Oversea Milk Products

Mr. LAMBERT asked the Minister of Agriculture if he was aware that, unless the import of overseas milk products was restricted, there would be such a glut of milk in the summer months as would result in the demoralisation of the market; and when he proposed to announce the policy of the Government on this subject.—Mr. ELLIOT replied: I can assure my right hon. friend that the matter is receiving the Government's close consideration, but I am not yet in a position to make a statement.

MONDAY, FEB. 5TH

Increased Allowances for Dependent Children

Mr. BOOTHBY asked the Minister of Labour what would be the additional cost to the insurance fund of an increase in the allowance for dependent children to 3*s.* in respect of the first child and 2*s.* 6*d.* in respect of the second.—Mr. R. S. HUDSON (Parliamentary Secretary to the Ministry of Labour) replied: An increase in the allowance for dependent children to 3*s.* in respect of the first child and to 2*s.* 6*d.* in respect of a second child would, on the basis of finance assumed from the Unemployment Bill, increase the amount of benefit estimated to be payable by about £1,050,000. This figure does not include transitional payments.

Institutional Treatment of Mental Defectives

Sir BASIL PETO asked the Minister of Health the total cost to the country for the last completed year of the institutional treatment of mental defectives.—Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) replied: The total cost falling upon public funds in respect of the mental deficiency service may be taken as having been approximately £1,875,000 in the year 1931–32, but exact information as to the amount included in this figure in respect of institutional treatment is not available.

Limitation of University Students in India

Sir WILLIAM DAVISON asked the Secretary of State for India whether steps would be taken by the Government of India to limit the numbers of Indians taking a university course with the object of obtaining a degree, in view of the numbers of Indian graduates leaving the universities each year without any chance of obtaining suitable employment; and whether he would obtain a report on this matter from the French Colonial Office, which for some time had limited the output of college-trained men with regard to the employment available for them in the particular colony.—Sir S. HOARE replied: It is for the authorities of the Indian universities and not for the Government to decide whether any limitation of the kind shall be imposed. I doubt whether the suggestion made by my hon. friend in the second part of his question would serve any useful purpose.

Sanitary By-laws in London

Mr. PEAT asked the Minister of Health whether he was aware that the sanitary by-laws in London still forbade improved methods of building and sanitation which were permitted elsewhere; and whether he would urge upon the county council the importance of simplifying and modernising those by-laws.—Sir HILTON YOUNG replied: I am in communication with the Londun County Council as to the best way of attaining the object desired by my hon. friend.

TUESDAY, FEB. 6TH

Committees of Inquiry

Replying to Mr. JOHN WILMOT, Mr. HORE-BELISHA (the Financial Secretary to the Treasury) said that among the Committees of Inquiry appointed during the last six years which had not yet finally reported were the Workmen's Compensation (Industrial Diseases) Committee, appointed to inquire as to the inclusion of turpentine poisoning and papillons; the Local Government and Public Health Law Consolidation Committee, appointed to consider the grouping of enactments in regard to consolidated legislation; and the Food Standards Committee, appointed to inquire into the law relating to the composition and description of articles of food.

Medical Services of Defence Forces

Capt. ELLISTON asked the Secretary to the Treasury, whether it was proposed to adopt the recommendations of the Warren Fisher Committee in reference to the Royal Army Medical Corps and other medical services of the Defence Forces.—Mr. HORE-BELISHA replied: I regret that owing to the time required for necessary consultation with the Government of India on this report, I am not yet in a position to announce the decision of His Majesty's Government; but I hope that it will be possible to do so at an early date.

Industrial Disease among Miners

Mr. DAVID GRENFELL asked the Secretary for Mines whether, in view of the prevalence of miners' phthisis in the coal-mining industry, he would consider the compulsory adoption of wet drilling-machines for boring in all operations for blasting and removal of stone in coal mines; and (2) the number of men certified to have been disabled by silicosis in the coal-mining industry from 1929 to the latest available date, and the numbers separately for the South Wales coalfield and the other mining districts.—Mr. ERNEST BROWN replied: I am informed by the Home Office that since June 1st, 1931, when the coal-mining industry first came within the scope of the General Medical Board under the Silicosis Compensation Scheme, 432 men in the industry have been certified by the Board to have been disabled or to have died from silicosis or from silicosis accompanied by tuberculosis; and that 385 of these cases occurred in the South Wales coalfield. Earlier comparable figures are not available. This extraordinary preponderance of cases of the disease in South Wales presents a very difficult problem, and no satisfactory explanation can as yet be given. As regards the more highly siliceous rocks, it is already compulsory to take dust prevention measures in drilling operations, while as regards other coal measure rocks, drilling machines are not used to any substantially greater extent in South Wales than in other coalfields. The application of a general measure of the kind proposed to drilling in all kinds of stone would not appear, therefore, to be an appropriate remedial measure.

Replying to supplementary questions, Mr. BROWN said that one inspector of the department was at work on the question. He was unable to assign any reason for the excessive deaths in Wales.

Deaths among Celanese Workers

Mr. EMRYS-EVANS asked the Home Secretary whether the experiments had made it possible to identify the particular chemical which was responsible for the deaths of the workmen employed at the British celanese factory at Spondon.—Sir JOHN GILMOUR replied: I am advised it can now be stated that the particular chemical in question was di-ethylene dioxide, otherwise known as dioxan. Investigations are proceeding as to the degree of toxicity of this substance with a view to determining under what conditions, if any, it can safely be used.

OBITUARY

JOHN KENNEDY WILL, M.D. Aberd.

THE death is recorded as occurring on Jan. 12th of Dr. John Kennedy Will, late medical superintendent of the Bethnal House Asylum. Born at Cullen, Banffshire, in 1857, he graduated in 1882 as M.B., C.M. at the University of Aberdeen, and shortly afterwards commenced his association with Bethnal House Asylum, being appointed assistant medical officer in 1884. Two years later, having proceeded to the M.D. degree, he succeeded to the medical superintendency, a post which he held for 14 years, when the property was taken over in connexion with a housing scheme and the asylum was pulled down. He now paid a visit to Ceylon, where he had family connexions, and since his return he lived at Sawbridgeworth in retirement. He married in 1889 Miss Ella Ring, and had a family of seven children, three sons and four daughters. Mrs. Will and the remaining members of the family survive him, but the second son, a noted football player, joined the Royal Air Force during the war and was killed in 1917.

Dr. Lindley Scott writes: "John Will's clear head and sound judgment made his advice much valued; firm enough he could be, but his gentleness and kind thought of others were very convincing. His hospitality at Bethnal House remained long in the recollection of many old students of the London. As a friend he was delightful, ever generous, full of anecdote, with a sporting instinct and a keen sense of humour. To know him well was to love him well. He leaves a gap in one's friendship very difficult to fill."

BERNARD HOLLANDER, M.D. Freiburg, M.R.C.S. Eng.

THE death is announced of Dr. Bernard Hollander, a physician of Austrian birth who worked nearly all his life in London, where he had lived for some 50 years, for 35 years as a naturalised British subject. In Vienna he was a pupil of Krafft-Ebing, and on settling in London he held various appointments as clinical assistant. He was widely known to the public as a profuse writer, from the popular point of view, on psychotherapeutic subjects. He denounced spiritualism, advocated phrenology, and wrote a readable work on hypnotism and suggestion, which was published about 25 years ago and which contained a good account for general purposes of the different methods of procuring the hypnotic state. More recently he wrote a large and ambitious work, entitled "In Search of the Soul," in which he essayed to review the mechanism of thought, emotion, and conduct, and he pleaded warmly for the early and individual treatment of mental cases.

Dr. Bernard Hollander was in his seventieth year, and his death followed upon an emergency operation.

MEDICAL NEWS

Royal College of Physicians of London

On Feb. 1st the diploma of L.R.C.P. was conferred upon William Bullock, University of Liverpool; H. D. Fairman, London Hospital; and J. R. Kingdon, St. Bart.'s Hospital.

On Feb. 27th and March 1st Sir George Buchanan will deliver the Milroy lectures, taking as his subject international coöperation in public health. On March 6th, 8th, and 13th Prof. E. C. Dodds will give the Goulstonian lectures. He will speak on hormones and their chemical relations. On March 15th and 20th the Lumleian lectures will be given by Dr. H. Letheby Tidy, who will speak on glandular fever and infective mononucleosis. On May 1st and 3rd Dr. C. H. Andrewes, as Oliver-Sharpey lecturer, will discuss viruses in relation to the ætiology of tumours. On June 5th, 7th, and 12th Prof. O. L. V. de Wesselow will deliver the Croonian lectures and will speak on arterial hypertension. All the lectures will be given at 5 P.M. at the Royal College of Physicians of London, Pall Mall East, S.W. They are open to members of the medical profession on presentation of a card.

Biochemical Society

The next meeting of this society will be held at the Lister Institute, Chelsea Bridge-road, London, S.W., on Friday, Feb. 16th, at 4.30 P.M.

West Kent Medico-Chirurgical Society

A meeting of this society will be held to-day, Friday, Feb. 9th, at 8.45 P.M., at the Miller General Hospital, Greenwich, S.E., when Dr. William Smith will read a paper entitled How Pathology can Help the Clinician.

London School of Hygiene and Tropical Medicine

The Prince of Wales has consented to become patron of this school, with which the Ross Institute is now incorporated. The announcement was made at a staff and students' dinner by Sir Austen Chamberlain, chairman of the court of governors.

Pharmaceutical Society of Great Britain

At a meeting of this society to be held at 17, Bloomsbury-square, London, W.C., on Tuesday, Feb. 13th, at 8.30 P.M., Prof. Edward Mellanby, F.R.S., will give a lecture on the influence of some nutritional factors in disease.

Paddington Medical Society

A meeting of this society will be held on Tuesday, Feb. 13th, at 9 P.M., at the Great Western Royal Hotel, Paddington, London, W. Dr. Robert Forbes, deputy medical secretary of the British Medical Association, will give an address on medical ethics. The secretary of the society is Dr. S. Crown, 81, Elgin-avenue, W.9.

British Institute of Philosophy

An address on Determinism, Indeterminism, and Freedom will be given by Prof. C. D. Broad at University College, Gower-street, London, W.C., at 8.15 P.M. on Tuesday, Feb. 13th. The chair will be taken by Prof. Julian Huxley. Cards of admission can be obtained from the director of studies, at University Hall, 14, Gordon-square, W.C.1.

Royal Medical Benevolent Fund

At the meeting held in January the committee voted 88 grants, amounting to £1971. The following are particulars of a few cases helped.

M.D., aged 82. Widower, has been in practice as long as his age and infirmity permitted. He is now confined to his bedroom living in very poor and straitened circumstances. He has no relatives who can give financial help. Income, which includes the old age pension of £26, approximately £48. Fund voted £40.

Widow, aged 77, of M.R.C.S. Husband had retired and was on pension which ceased at his death. The widow was left with private means of £20. A charity has made a grant of £30. Fund voted £13 for a period of six months, pending application for old age pension.

Widow, aged 64, of M.B. On husband's death in 1924 the widow had to look for employment. She acted as housekeeper in a nurses' home for some years until failing health compelled her to give up the post. She is suffering from cardiac enlargement. National health insurance £1 4s. a month, letting room £1 a month, friends have given £15. Fund voted £26.

Cheques should be made payable to the hon. treasurer of the fund, 11, Chandos-street, Cavendish-square, London, W.1.

Medical Officers of Schools Association

The annual general meeting of this association will be held at 11, Chandos-street, Cavendish-square, London, W., on Friday, March 2nd, at 5 P.M. Sir Montagu Foster and Dr. H. C. Cameron will open a discussion on the necessity for greater reciprocity between parents, consultants, home doctors, and school authorities, more especially in matters relating to health.

Chadwick Lectures

On Tuesday, Feb. 13th, at 5.30 P.M., Sir William Collins will take the chair at a lecture to be given by Mr. Eugen Kaufmann in the hall of the Royal Institute of British Architects, 9, Conduit-street, London, W. Mr. Kaufmann will speak on housing, town and regional planning in Soviet Russia. Information about this and other lectures may be had from the secretary of the Chadwick Trust, Mrs. Aubrey Richardson, 204, Abbey House, Westminster.

British College of Obstetricians and Gynæcologists

The quarterly meeting of the council was held on Jan. 29th, with Dr. J. S. Fairbairn, the president, in the chair. Dr. Lucian de Zilwa was admitted a foundation Fellow in absentia. The following were elected to the membership:

Margaret Anderson, Gavin Stiell Brown, Frederick William Buddee, Charlotte Douglas, Gwyneth Griffiths, Kathleen Harding, Lionel George Higgins, Gladys Hill, Harry Leaver, John Cyril Holdich Leicester, Jocelyn Moore, Herbert Kenneth Pacey, Percy Peltz, John Marshall Scott, and Arthur Joseph Wrigley, and, in absentia, Arthur Benyon Nash, David Johannes Malan, George Milburn White, and Blake Haverson Watson.

Life-saving and First-Aid Congress

The fourth International Congress for Life-saving and First Aid in cases of Accidents will be held from June 11th to 16th at Copenhagen in the Christiansborg Castle, the seat of the Danish parliament. A British committee for the congress has been provisionally formed which includes: Sir Thomas Oliver (chairman), Prof. S. Lyle Cummins, Prof. E. L. Collis, Prof. John Glaister, Colonel P. S. Lelean, Colonel D. J. Mackintosh, Dr. D. A. Colles, Dr. Theodore Thompson, and Dr. Gilbert Burnet. Further particulars may be had from Mr. G. L. Perry, the secretary of the Industrial Welfare Society, 51, Palace-street, London, S.W.1.

Cheap Milk for School-children

Addressing a farmers' organisation at Northallerton, on Feb. 2nd, Mr. Thomas Baxter, chairman of the Milk Marketing Board, pointed out that the standard of health of the nation and the ability to resist disease would be greatly increased by an ample supply of good milk during childhood. According to a report in the *Manchester Guardian* (Feb. 3rd), he said that if the Minister of Health, the medical profession, and the distributors of milk would coöperate with the Board they were prepared to consider the possibility of providing ample supplies of good milk to school-children at a greatly reduced rate.

An Award in Electrotherapy

Dr. W. J. Turrell, physician-in-charge of the electrotherapeutic department of the Radcliffe Infirmary, Oxford, has received from Dr. Norman E. Titus, of New York, who is now visiting London, the "gold key" awarded to him at the last annual meeting of the American Congress of Physical Therapy. This award is made for original research and distinguished services in the field of electrotherapy, and among other recipients have been Prof. d'Arsonval, Dr. Harvey Cushing, Prof. Claudius Regaud, and Dr. Gustav Bucky. The presentation to Dr. Turrell was made at a dinner offered to Dr. Norman Titus by Dr. Howard Humphris, to whom the award was made by the Congress of 1932. Among those present were Sir Henry Gauvain, Sir Leonard Hill, Sir William Willcox, Dr. R. King Brown, Dr. J. B. Mennell, and Dr. Franz Nagelschmidt. In a speech of acceptance, Dr. Turrell said that he felt that all who practised physiotherapy should first devote at least ten years to gaining the clinical experience which only a general physician and surgeon could obtain.

Gray's Inn

Mrs. L. S. Farquharson, M.B., D.P.H., was called to the Bar at Gray's Inn on Jan. 26th.

Wolverhampton Royal Hospital

For the first time in many years this institution in 1933 paid its way. The £43,000 received from the Contributory Association is an increase of more than £10,000. In 1931 the hospital spent £18,000 more than it received and there had been serious thoughts of closing some of the wards. The debt to the bank, however, still exceeds £60,000.

Leicester Royal Infirmary

The report for 1933 states that at £85,970, expenditure exceeded income by £493, which brings up the total deficiency spread over the last ten years to £26,870. Both annual subscriptions and the Hospital Saturday Fund have fallen off—the latter has been diminishing for several years. The hospital which has radium to the value of £7250 has now been recognised as a centre by the National Radium Commission.

Connaught Hospital, Walthamstow

Prince Arthur of Connaught recently opened extensions of this hospital which have cost about £10,000 A new ward has been provided as a memorial to the late Mrs. Mathews, wife of Alderman A. M. Mathews, of Leyton, who has contributed £4500 towards the cost of the whole scheme. The cost of a new massage department has been borne by Mrs. J. H. Keene in memory of her husband. The hospital was established in 1878, primarily for the inhabitants of Walthamstow, Leyton, and Wanstead.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 13th.

Therapeutics and Pharmacology. 5 P.M. Dr. C. Kaufmann (Berlin): Therapeutics with Hormones of the Ovary. Followed by Mr. A. S. Parkes, F.R.S., Prof. E. C. Dodds, Dr. H. Gardiner-Hill, Mr. Aleck Bourne, and others. Obstetrics and Gynæcology: Members of this Section are specially invited to attend the Meeting.

Psychiatry. 8.30 P.M. Dr. R. D. Curran: A Clinical Study of Delirium.

THURSDAY.

Dermatology. 5 P.M. (Cases at 4 P.M.) Cases: Dr. H. Barber: (1) Nævus unius lateris of the mouth associated with multiple nævi of various types. Dr. I. Muende: (2) Leprosy. Dr. A. Peters: (3) Hirsutes treated with ovarian follicular hormone. Other cases will be shown.

Neurology. 8.30 P.M. Discussion: Intracranial pressure; its clinical and pathological importance. Openers: Mr. Lambert Rogers, Dr. Ritchie Russell, Dr. Fergus Ferguson, and Dr. F. W. Pickering. Other speakers will take part.

FRIDAY.

Physical Medicine. 5.30 P.M. Surgeon Commander G. Murray Levick: The Expedition of the Public Schools Exploring Society to Northern Finland. (Illustrated by film.) A discussion will follow on the physical effects of a long "pack march" upon boys of 19 years of age. United Services: Members of this Section are specially invited to attend the Meeting and to take part in the discussion.

Obstetrics and Gynæcology. 8.15 P.M. Mr. V. B. Green-Armytage: Post-menopausal Uterine Hæmorrhage. Mr. M. M. Datnow: Vaginal Hysterectomy. (Illustrated by cinematograph demonstration.) Followed by Mr. A. C. Palmer, Prof. Miles Phillips, Prof. Beckwith Whitehouse, and others.

Radiology. 8.15 P.M. Discussion on Radiodiagnosis in the Diseases of Children. Openers: Dr. B. Shires and Dr. C. G. Teall. Followed by Dr. Wilfred Pearson and Dr. N. B. Capon. N.B.—Members are requested to note the change in time of the Meeting.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Feb. 12th.—8.30 P.M., Discussion on The Present Position of the Vaccination Question. To be introduced by Dr. C. Killick Millard.

SOUTH-WEST LONDON MEDICAL SOCIETY, Bolingbroke Hospital, Wandsworth.

WEDNESDAY, Feb. 14th.—9 P.M., Dr. Gerald Slot: Drunkenness.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montagu-street, W.C.

FRIDAY, Feb. 16th.—5 P.M., Dr. Peter Edwards, Dr. George Jessel, Dr. G. T. Hebert, Dr. R. C. Wingfield, and Dr. F. T. H. Wood: Modern Developments in Dispensary and Sanatorium Work.

PADDINGTON MEDICAL SOCIETY.

TUESDAY, Feb. 13th.—9 P.M. (at the Great Western Royal Hotel, Paddington, W.), Dr. Robert Forbes: Medical Ethics. Discussion.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.

THURSDAY, Feb. 15th.—8.15 P.M. Discussion on blood regeneration in the anæmias. The following papers will be read: Prof. A. E. Boycott: Regeneration of Red Blood Corpuscles. Dr. Janet Vaughan: The Hæmopoietic Response to Therapy in Non-tropical Anæmias. Dr. N. Hamilton Fairley: Blood Regeneration and Reticulocytosis in Certain Diseases of the Tropics.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, 17, Bloomsbury-square, W.C.

TUESDAY, Feb. 13th.—8.30 P.M., Prof. E. Mellanby: The Influence of some Nutritional Factors in Disease.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

TUESDAY, Feb. 13th.—4 P.M., Sir Cuthbert Wallace: Hunterian Oration.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Feb. 12th to SATURDAY, Feb. 17th.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Course in Dermatology. Afternoons and evenings: lectures and demonstrations. Practical Pathology arranged, if desired. (Open to non-members).—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W. Lecture-demonstration on Constipation, by Dr. A. E. Clark-Kennedy, on Tues., at 2.30 P.M. to 4 P.M.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Course in Gynæcology. Mornings and/or afternoons.—HOSPITAL FOR CONSUMPTION, Brompton, S.W. Course in Diseases of the Chest. All day.—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. Demonstration on Ante-natal Diagnosis and Treatment. Fri., at 5 P.M., by Dame Louise McIlroy.—INTERPRETATION OF PYELOGRAMS. Tues. and Fri., at 8 P.M., by Dr. G. R. Mather Cordiner.—PANEL OF TEACHERS. Individual clinics in various branches of medicine and surgery are available daily by arrangement with the Fellowship of Medicine. Courses of instruction, lectures, demonstrations, &c., arranged by the Fellowship of Medicine are open only to Members and Associates, unless otherwise stated.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, Feb. 12th.—10 A.M., Medical Wards, Skin Clinic. 11 A.M., Surgical Wards. 2 P.M., Gynæcological and Surgical Wards, Operations, Medical, Surgical, Gynæcological, and Eye Clinics.

TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Wards. 2 P.M., Medical, Surgical and Throat Clinics, Operations. 4.15 P.M., Lecture. Mr. Roche: Some Genito-Urinary Conditions.

WEDNESDAY.—10 A.M., Medical and Children's Wards, Children's Clinics. 2 P.M., Medical, Surgical and Eye Clinics, Gynæcological Operations.

THURSDAY.—10 A.M., Gynæcological and Neurological Clinics. 11 A.M., Fracture Clinic. 2 P.M., Medical, Surgical, Eye and Genito-Urinary Clinics, Operations.

FRIDAY.—10 A.M., Skin Clinic. 12 noon, Lecture on Treatment. 2 P.M., Medical Surgical and Throat Clinics, Operations.

SATURDAY.—10 A.M., Medical and Surgical Wards, Surgical and Children's Clinics. The Lectures at 4.15 P.M. are open to all Medical Practitioners without fee.

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, Feb. 12th.—5 P.M., Mr. H. R. Ing, D.Phil., Chemical Structure and Pharmacological Action (first of six public lectures).

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Feb. 12th.—2 P.M., Dr. Riddoch: Out-patient clinic. 3.30 P.M., Dr. Martin: Disorders of the Pituitary Body (2).

TUESDAY.—2 P.M., Dr. Walshe: Out-patient clinic. 3.30 P.M., Dr. Grainger Stewart: Subacute Combined Degeneration.

WEDNESDAY.—2 P.M., Dr. Martin: Out-patient clinic. 3.30 P.M., Dr. James Collier: Clinical Demonstration.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient clinic. 3.30 P.M., Dr. Gordon Holmes: Tumours of the Central Nervous System (2).

FRIDAY.—2 P.M., Dr. Adie: Out-patient clinic. 3.30 P.M., Dr. Gordon Holmes: Tumours of the Central Nervous System (3).

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.
THURSDAY, Feb. 15th.—4.30 P.M., Dr. C. B. Heald: Value of Sport and Exercise in the Prevention of Disease. 9 P.M., Mr. St. J. D. Buxton: Muscle and Tendon Injuries.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
THURSDAY, Feb. 15th.—3.15 P.M., Mr. C. S. Lane Roberts: Recent Advances in Obstetrics.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
MONDAY, Feb. 12th and following 4 days.—12.30 P.M., Course in Methods of Examination and Diagnosis.
FRIDAY.—4 P.M., Mr. J. D. McLaggan: Giddiness.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Feb. 13th.—5 P.M., Dr. M. Sydney Thomson: Lupus Erythematosus.
WEDNESDAY.—5 P.M., Dr. I. Muende: Histopathology of Pigmentary Conditions of the Skin.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.
WEDNESDAY, Feb. 14th.—4 P.M., Dr. F. E. S. Willis: Effect of Pleural Effusions on Pulmonary Disease. (Lantern).

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, Feb. 14th.—4 P.M., Dr. W. E. Lloyd: Points in the Diagnosis of the less Common Chest Diseases.

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace-road, S.W.
THURSDAY, Feb. 15th.—5.15 P.M., Dr. James Fenton: Administration of the Housing Acts.

NATIONAL COUNCIL FOR MENTAL HYGIENE.
WEDNESDAY, Feb. 14th.—5 P.M. (at 11, Chandos-street, Cavendish-square, W.), Dr. Doris M. Odlum: Mental Hygiene in the Changing World.

ST. MARY'S HOSPITALS, Manchester.
FRIDAY, Feb. 16th.—4.15 P.M. (at the Whitworth-street West Hospital), Dr. Addis: Pre-sacral Sympathectomy.

SALFORD ROYAL HOSPITAL.
FRIDAY, Feb. 16th.—4.15 P.M., Mr. Garnett Wright: Surgical Treatment of Toxic Goitre.

LEEDS GENERAL INFIRMARY (Post-graduate Clinic).
TUESDAY, Feb. 13th.—4 P.M. (at the Hospital for Women), Mr. A. Gough: Gynæcological Demonstrations.

GLASGOW POST-GRADUATE LECTURES.
TUESDAY, Feb. 13th.—3.30 P.M. (in the Faculty Hall, Vincent-street) Dr. H. P. Fairlie: Recent Work on Anæsthesia.
WEDNESDAY.—4.15 P.M. (at the Royal Infirmary), Dr. J. F. Smith: Skin Cases.

Appointments

DUNSCOMBE, N., M.B., B.Chir., D.P.H. Camb., has been appointed Medical Officer of Health, Finsbury.

London County Council Hospital Staff.—The following appointments are announced. A.M.O. (I.) and (II.)=Assistant Medical Officer, Grades I. and II.
MITMAN, M., M.D., M.R.C.P. Lond., D.P.H., D.M.R.E. Camb. Senior A.M.O. (I.), Grove Hospital.
THOMAS, R. G., M.B. Lond., F.R.C.S. Edin., A.M.O. (I.), St. Luke's Hospital, Lowestoft.

Certifying Surgeons under the Factory and Workshop Acts:—LOGAN, H. A., M.B., Ch.B. Belf. (Mossley, Lancs); SHERWELL, A. E., M.B., Ch.B. Brist. (Rainham, Essex); and WILDMAN, W. S., F.R.C.S. Eng., L.R.C.P. Lond. (Tewkesbury, Gloucester).

Vacancies

For further information refer to the advertisement columns

All Saints Hospital for Genito-urinary Diseases, West-square, S.E.—Res. H.S. £100–£150.
Barnsley, Beckett Hospital and Dispensary.—H.P. £200.
Birmingham Ear and Throat Hospital.—Third H.S. At rate of £50.
Birmingham and Midland Eye Hospital, Church-street.—Asst. Surgeon.
Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.
Bootle General Hospital.—H.P., Two H.S.'s., and Cas. O. Each at rate of £150.
Bradford City Sanatorium, Grassington.—H.P. £175.
Brighton, Royal Sussex County Hospital.—Asst. Pathologist. £500.
Canterbury Dispensary, 60, Burgate.—Res. M.O. £100.
Carlisle, Cumberland Infirmary.—H.P. Second H.S. Also H.S. to Spec. Depts. Each at rate of £155.
City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.
Croydon County Borough.—Two Asst. M.O.'s and Asst. School M.O.'s. Each £500.
Dorset County Council.—Chief Clin. Tuber. O. £750.
Great Barrow, East Lancashire Tuberculosis Colony.—H.P. At rate of £100.
Great Yarmouth General Hospital.—H.S. £140.
Hampstead General and N.W. London Hospital, Haverstock-hill, N.W.—Cas. Surg. O. At rate of £100.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100.
Hull Royal Infirmary.—H.P. to Sutton Branch Hospital. At rate of £160. Also Cas. O. At rate of £150.
Ilford, King George Hospital.—H.S. At rate of £100 [illegible]
Kendal, Westmorland County Hospital.—H.S. At rate of £200.
Kensington Royal Borough.—Asst. M.O. £500.
Liverpool University.—Bacteriologist. £1500.
London County Council.—Asst. M.O. £600.
London Hospital, E.—Medical First Asst. and Reg. £300.
London Lock Hospital, 91, Dean-street, W.—Res. M.O. to Male Depts. At rate of £175.
London Lock Hospital, 283, Harrow-road, W.—Res. M.O. to Female Depts. At rate of £175.
Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Sen. Res. M.O. At rate of £125.
Manchester, Monsall Hospital for Infectious Diseases.—Jun. M.O. £300.
Manchester and Salford Hospital for Skin Diseases.—Asst. M.O. £110. Also H.S. At rate of £100.
Manchester, Victoria Memorial Jewish Hospital, Cheetham.—Res. Surg. O. £200.
Miller General Hospital, Greenwich-road, S.E.—H.P. and H.S. Each at rate of £100.
Newark General Hospital.—Res. H.S. £175.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Asst. S. to Orthopædic Dept.
Preston, County Mental Hospital, Whittingham.—Jun. Asst. M.O. £500.
Preston, Sharoe Green Hospital.—Jun. Asst. Res. M.O. At rate of £100.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—District Res. M.O. Also Asst. Res. M.O. Each at rate of £80.
Royal Eye Hospital, St. George's-circus, Southwark, S.E.—H.S. and Asst. H.S. At rate of £150 and £100 respectively.
Royal National Orthopædic Hospital, Great Portland-street, W.—H.S. for Brockley-hill, Stanmore. At rate of £150.
Royal National Orthopædic Hospital, 234, Gt. Portland-street, W. Locum H.S. At rate of £150. Also H.S. for Brockley hill, Stanmore. At rate of £150.
St. Bartholomew's Hospital, E.C.—Dental H.S. £80.
St. Helens Hospital.—Sen. H.S. £200.
St. Thomas's Hospital—Obstetrician and Gynæcologist.
Salvation Army, Mother's Hospital, Lower Clapton-road, E.—Jun. Res. M.O. At rate of £80.
Sheffield Royal Infirmary.—Asst. Aural and Ophth. H.S. and H.P. to Dermatologist. Each at rate of £80. Also Jun. Asst. Pathologist. £300.
Shoreham-by-Sea, Southlands Hospital.—Asst. M.O. £350.
Shrewsbury, Royal Salop Infirmary.—Res. Surg. O. £250.
Southampton Children's Hospital and Dispensary for Women Hon. Surgeon.
Southampton, Royal South Hants Hospital.—Hon. Surgeon. Also Hon. Surgeon to Ear, Nose, and Throat Dept.
Swansea General and Eye Hospital.—H.S. At rate of £150.
Taunton, Somerset and Bath Mental Hospital, Cotford.—Res. Sen. Asst. M.O. £550.
West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, N.W.—Hon. Anæsthetist. Also Hon. Dental Surgeon. Also Sen. H.P. At rate of £150.
Wrexham and East Denbighshire War Memorial Hospital.—Res. H.S. At rate of £150.

Births, Marriages, and Deaths

BIRTHS

DARMADY.—On Feb. 1st, at Devonshire-place, W., the wife of Dr. E. M. Darmady, of a son.
FITZGIBBON.—On Jan. 21st, in London, the wife of G. M. FitzGibbon, M.D., F.R.C.S., of Pembroke-road, Clifton, Bristol, of a daughter.
FORSYTH.—On Jan. 27th, at Streatham Manor, the wife of Dr. J. M. Forsyth, Timber Den, Farnborough, Hants, of a daughter.
ROCHE.—On Jan. 28th, at Scalloway, Shetland, the wife of Dr. George Douglas Roche, of a son.
WILSON.—On Jan. 31st, at a nursing-home, Withington, the wife of Dr. Henry Wilson, Whitmore, Gatley, of a daughter.

DEATHS

ATKIN.—On Feb. 2nd, the result of an accident, Charles Atkin, F.R.C.S. Eng., Endcliffe Croft, Sheffield.
BRIGGS.—On Thursday, Feb. 1st, at Premier House, Gregory Boulevard, Nottingham, Florence Emily, the devoted wife of Dr. J. A. Oswald Briggs.
FROSSARD.—On Jan. 29th, at The Lodge, Bishops Lydeard, Emilien Edward Frossard, M.R.C.S., L.R.C.P. Lond.
KENNEDY.—On Feb. 3rd, suddenly, at Gay-street, Bath, Wm. Player Kennedy, M.D.
MACKERN.—On Jan. 31st, very suddenly, at Silverwood, Newick, Sussex, John Mackern, M.D., F.R.C.S., aged 78 years.
SANDERS.—On Jan. 30th, at Horton Lodge, Gloucester, Thomas Sanders, M.R.C.S., L.R.C.P., B.A. Camb.
SNODGRASS.—On Feb. 1st, at R.V. Hospital, Netley, William McE. Snodgrass, Major, R.A.M.C., of Lifford, co. Donegal, aged 42.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

PRECAUTIONS AGAINST ELECTRIC SHOCKS

The X Ray and Radium Protection Committee has issued revised recommendations on the precautions to be taken against electric shocks in X ray rooms. They are as follows:—

1. The floor-covering of the X ray room should be of insulating material such as wood, rubber, or linoleum.

2. Where permanent overhead conductors are employed they should be not less than 9 ft. (3 metres) from the floor. They should consist of stout metal tubing or other coronaless type of conductor. The associated connecting leads should be of coronaless wire kept taut by suitable rheophores.

3. Wherever possible earthed guards or earthed sheaths should be provided to shield the more adjacent parts of the high-tension system. Unshielded leads to the X ray tube should be in positions as remote as possible from the operator and the patient. The use of "shockproof" X ray equipment in which the high-tension circuit is completely enclosed in earthed conductors is specially recommended. Unless there are reasons to the contrary, metal parts of the apparatus and room should be efficiently earthed.

4. Main and supply switches should be very accessible and distinctly indicated. They should not be in the proximity of the high-tension system, nor should it be possible for them to close accidentally. The use of quick-acting, double-pole circuit breakers is recommended. Overpowered fuses should not be used. If more than one apparatus is operated from a common generator, suitable high-tension multi-way switches should be provided. In the case of some of the constant-potential generators, a residual charge is held by the condensers after shutting down. A suitable discharging device should therefore be fitted.

5. Some suitable form of kilovoltmeter should be provided to afford a measure of the voltage operating the X ray tube. Wherever possible a safety spark-gap should be provided.

6. Special electrical precautions should be taken in rooms where low flash point anæsthetics are used in conjunction with X rays.

The committee wishes to emphasise the great importance of these precautionary measures to all persons responsible for, or working in X ray departments. Every step possible should be taken to prevent accidental contact with any part of the high-tension system, including the tube, the leads and the associated measuring instruments.

While the use of shockproof X ray equipment in which the high-tension circuit is completely enclosed in earthed conductors is specially recommended, much can be done with existing apparatus in the way of providing relatively simple devices, such as earthed guards to shield the more adjacent parts of the high-tension system. Mobile units, in particular, should be carefully examined before their use in the case of every patient. Further, schemes of suitably illuminated warning notices which function when the equipment is "alive," are found to serve a very useful purpose. Printed first-aid instructions for dealing with electrical shock should be available and the staff trained in their use. Cards of this kind are issued by the *Electrical Review* office, 4, Ludgate-hill, London, E.C.

The chairman of the X Ray and Radium Protection Committee is Sir Humphry Rolleston, and the hon. secretaries Prof. Sidney Russ and Dr. Stanley Melville, who may be addressed at 9, Chandos-street, W.1.

A HEARING AID FOR USE IN DEAF AND DUMB SCHOOLS

A FEW months ago we commented [1] on a wireless set made by the Multitone Electric Company which is adapted especially for the use of deaf persons. It is a 5-valve instrument of transportable size, fitted with a tone-control device to vary the point of greatest amplification to different parts of the scale, in order to adapt the reproduction to various forms of deafness; and it is provided with a "head-phone" containing an independent volume-control by means of which a deaf person can listen in, while other members of the family hear the loud-speaker at normal volume. In addition, by moving a switch, the loud-speaker can be converted into a transmitter which enables the deaf person to hear conversation through his head-phone. We mentioned that the manufacturers claim that many deaf-mutes can be made to hear sounds through this instrument, and that, if this claim is substantiated, the apparatus would obviously be invaluable to instructors of the deaf. An opportunity kindly provided by the authorities of seeing one of these instruments in use at the Tottenham School for Deaf and Dumb Children supplied convincing evidence that those deaf-mute children who have a remnant of hearing can appreciate and repeat syllables and words by its aid. A new adjustment in the apparatus makes it possible to fit a number of head-phones to one instrument, each with independent tone- and volume-control, and receivers for hearing by bone-conduction can be supplied as well as the usual type of head-phone.

[1] THE LANCET, 1933, ii., 817.

ENDOCRINE EQUILIBRIUM IN DIABETES

THE inter-relationship of the endocrine glands is such that an abnormality of one is liable to result in dysfunction of others. Some of them, of course, are linked particularly closely in regard to specific function: thus carbohydrate metabolism is mainly regulated by the triad of the pancreas, the pituitary, and the suprarenals, whilst the thyroid gland is also operative though less conspicuously. This is well seen in those cases of pituitary tumour where the pancreas, suprarenals, and possibly the thyroid also have been secondarily affected.

Dr. Franco Introna has reported in *Policlinico* (1933, xl., 1401) three cases which are of interest in this connexion. All were examples of so-called insulin-resistant diabetes, in which the blood-sugar remained above 300 mg. per 100 c.cm., and the ketosis was unaltered after intensive insulin treatment; in each case asthenia and wasting were marked. The first patient was a woman of 42, who was admitted in a precomatose state and, in spite of large doses of insulin administered subcutaneously and intravenously, died after 24 hours in coma. Autopsy showed a complete and uniform atrophy of the pancreas and a marked hypertrophy of the thyroid, which was rich in colloid. The thyroid enlargement was not clinically obvious, since it extended principally into the tracheo-œsophageal space. There was complete atrophy of the ovaries, with no evidence of recent maturation of follicles. Introna suggests that here the thyroid hyperfunction was responsible for the state of insulin resistance and for the persistent ketosis.

The second patient was a man of 23, with severe diabetes and asthenia of 18 months' duration. One hundred units of insulin a day, with reduction of the carbohydrate intake to 70 g., produced only the slightest effect on the blood-sugar (which remained over 300 mg. per 100 c.cm.) and left the polyuria and ketosis unaffected. Hyperthyroidism was suspected, and the basal metabolic rate was found to be + 30 per cent. The patient was given intensive radiation to the thyroid, and although the insulin was dropped to 70 units a day, there was rapid disappearance of the glycosuria and ketosis, great reduction of the polyuria, and rapid gain in weight. The patient has been able to continue the dietetic and insulin treatment satisfactorily at home.

In the third case, again, intensive insulin treatment in a diabetic of 37, who had suffered from the condition for some two years, caused no lowering of the blood-sugar or diminution of the ketosis. It resulted, however, in reduction of the polyuria owing to water retention, and a state of severe œdema rapidly

developed which was only partially relieved by the use of intravenous calcium chloride. The condition of wasting was unaffected. On the supposition that hyperfunction of the posterior lobe of the pituitary might, in conjunction with insulin, interfere with water excretion and at the same time antagonise the action of insulin on carbohydrate metabolism, a radiogram was taken of the sella turcica, which showed the latter enlarged in size but normal in shape. Radiotherapy was applied to the pituitary region, in spite of the X ray appearances which could hardly be said to provide evidence of definite abnormality. It was found that the tendency of insulin to produce œdema was gradually reduced, whilst at the same time the insulin became effective in controlling the diabetic state. The patient was ultimately well compensated with a moderate dosage of insulin and an average intake of carbohydrate.

The histories of the three cases strongly suggest at least that the thyroid and pituitary glands play an important part in the failure of the patients to respond to insulin treatment. They show the importance of careful investigation and, if necessary, a therapeutic test in cases of insulin-resistant diabetes.

NEW PREPARATIONS

CALCIBRONAT.—This new preparation issued by the Sandoz Products (J. Flint), 5, Wigmore-street, London, W., aims at presenting a combination of the therapeutic qualities of bromine and calcium in a lactobrionate, its use being thus suggested in all conditions where bromide therapy is indicated. The preparation reaches us in two forms, as granules and as effervescent tablets. Each tablet contains 7 grains of the bromine and from one to three tablets daily is suggested as an average dose for the adult. A tablet corresponds to a teaspoonful of granules. The dosage for children would be one-third to two-thirds of the adult dose according to the age and weight of the child and the advice of the medical adviser.

HEPASTAB, an intramuscular liver extract, is manufactured and issued by Boots Pure Drug Company, Nottingham. It is claimed for the preparation that it is a concentrated sterile solution of the anti-anæmic factor of mammalian liver, and the manufacturers warrant that every batch has been clinically tested and proved hæmopoietically active before issue in hermetically sealed ampoules. In doses of from 4 c.cm. to 6 c.cm. the drug has been found to initiate remissions in cases of pernicious anæmia, the intramuscular administration producing a restoration of the red blood-cell count and of the percentage hæmoglobin to a satisfactory level. It is recommended that further injections might be given at intervals at the discretion of the physician, such subsequent doses being controlled by the blood counts as well as by the general condition of the patient.

Corrigendum.—MENFORMON (Œstrogenic hormone folliculin). In the advertisement of this preparation which appeared in our issue of Jan. 27th the 5 c.cm. bottle of aqueous solution was incorrectly described as containing 50,000 international units. This should have read "5000 units"; the former strength applies to the oily solution only.

TORTURE

A BOOK on this subject[1] must make horrible reading, and Dr. Parry's record of English experience lives up to the necessity. It treats of every aspect and side of the use of torture in this country, whether applied as punishment or as a drastic method of extracting information or confession. The instances of cruelty described are sickening and the use of torture was continued in England until a later date than most of us were aware, the middle of the seventeenth century and the immediately previous period witnessing more horrible instances than earlier history. Dr. Parry does not confine himself to defining torture in the legal sense of the word—that is, he not only describes the brutal sentences allowed by judicial procedure, but records certain trials in which the special cruelty to the prisoner was an important element. Strictly speaking there is nothing medical in the book, but, of course, psychological lessons may be derived from consideration of the emotional and social factors that could have led to the bestiality in a country where other sides of life showed that cruelty was wholly alien to the disposition of the people. Dr. Parry has dealt with the subject graphically, and what he has written makes valuable though painful reading. Times have improved.

[1] The History of Torture in England. By L. A. Parry, M.D., B.S., F.R.C.S. London: Sampson Low, Marston and Co., Ltd. 1934. Pp. 244. 10s. 6d.

WHO'S WHO, 1934

The current issue of "Who's Who" contains brief autobiographies of 40,000 contemporary notabilities, "fifty for one penny" as the publisher points out. Each year more than a thousand entries are deleted on evidence of death and half as many again are added to the total. As it grows yearly larger it becomes ever more useful as a work of current reference: with more and more efficiency it serves the journalist, the hostess, the organiser, the proposer of the guests, and (last but not least) all those who need a comprehensive view of the factors which make for success in life. The entries vary in length and value, not always in the same proportion, but that is not the fault of the publisher but of the autobiographer. The volume has more than 3600 pages, is bound in buckram, and published by Messrs. A. & C. Black, Ltd., at 60s.

CHEMICAL WARFARE

Dr. P. A. T. Sneath[1] brings a robust if sober optimism to the consideration of future perils from the air. He quotes the statement of Prof. J. B. S. Haldane that the lung irritants chlorine and phosgene, although they killed with great suffering about a quarter of those they attacked, are probably almost as obsolete as muzzle-loading cannon, because of their chemical nature and the adequacy of the protection from them which respirators give. On the other hand, diethyl-sulphide or mustard gas, probably the most effective chemical of its kind used in the war, killed less than one in forty and permanently disabled only about one in two hundred of its casualties. Sneath points out that the chief use of chemical weapons has been to terminate a condition of static warfare by forcing the enemy to give battle. The development of aircraft and the mechanisation of land forces may both, he suggests, tend to a war of movement, which may not foster the use of chemicals. Gas attack on the civilian population would not, he holds, be effective if the population were prepared and adequate defensive measures were taken.

COMET Z. By GEORGE WESTON. London: Methuen and Co., Ltd. Pp. 280. 7s. 6d.—This book sets out the position arising out of a suspension of the laws of physics by which the proximity of a comet acts disastrously on human fertility. We are asked to visualise a condition of things under which the population of the world depends upon the propagating power of an individual, the perfect male. Under an Emergency Marriage Act, designed to give the human race larger chances, 7,000,000 unmarried American males of marriageable age entered into matrimony upon the day of the passing of the Act. As the comet shortly exploded, the future imagined for America seems to be one of distinct overcrowding. The complications of the story are readably rendered.

MEDICAL BIBLIOGRAPHY.—Our issue of Jan. 6th contained an account (p. 30) of a "check-list" of texts illustrating the history of medicine which was issued as a supplement to the Bulletin of the Institute of the History of Medicine, Johns Hopkins University. We are informed that a limited number of reprints of this list are available and may be had from the Institute, 1900, East Monument-street, Baltimore, Md., U.S.A. The price is 75 cents.

[1] Canad. Med. Assoc. Jour., December, 1933, p. 640.